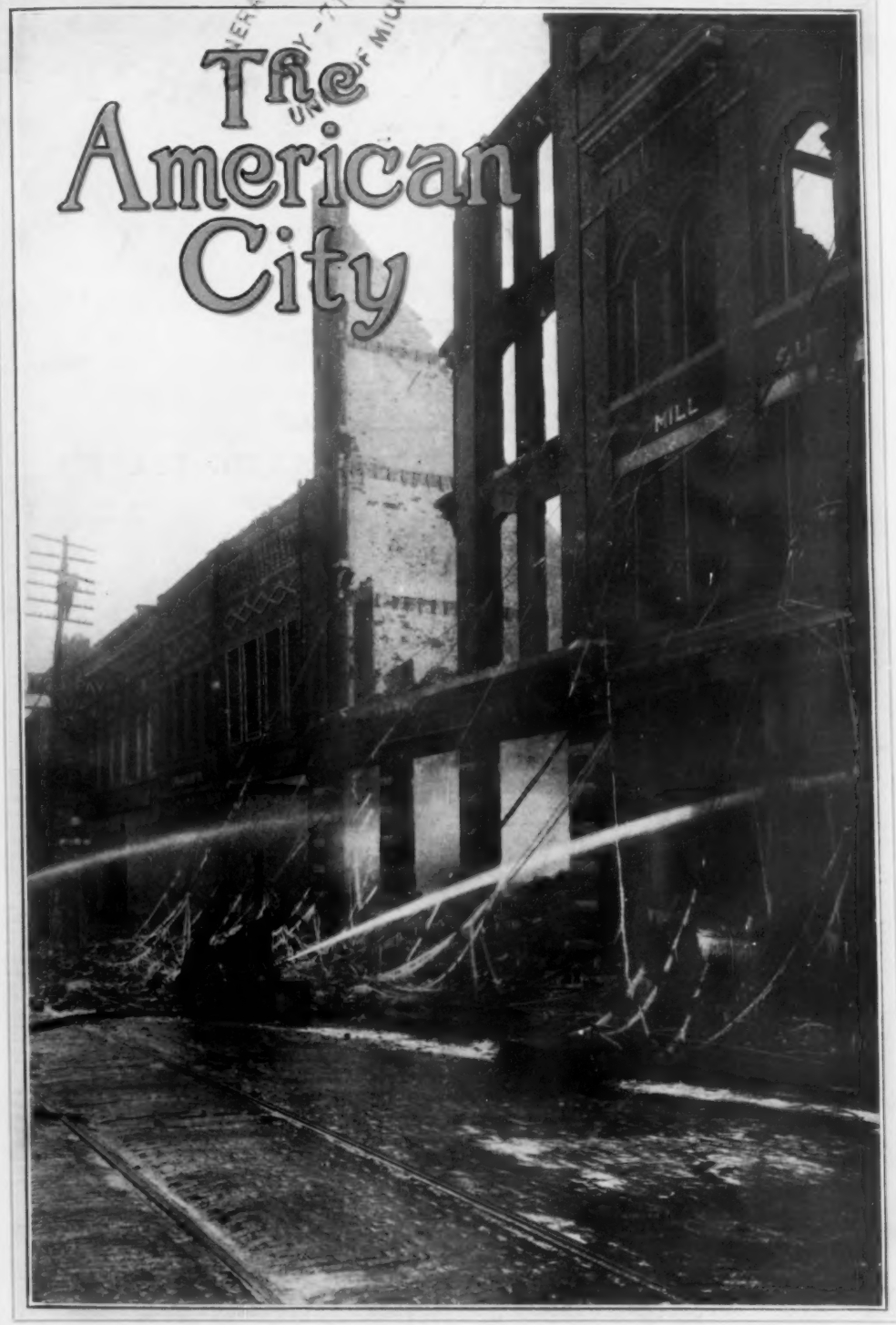
April, 1920

Vol. XXII No. 4
35 Cents $3 a Year.

GENERAL LIBRARY - 7 1920 UNIV. OF MICH.

The American City



Occasional conflagrations seem to be inevitable, but in the long run that city will suffer the least from the ravages of fire, which combines an efficient and well-equipped fire department with a building code and fire prevention inspection that will tend to stop fires before they start

The Mathieson Alkali Works, Inc.

General Offices

25 WEST 43rd STREET

New York City

WORKS
Niagara Falls, N. Y.

WORKS
Saltville, Va.

EAGLE-THISTLE BRAND

CASTNER ELECTROLYTIC PROCESS

LIQUID CHLORINE

Pure, anhydrous, for use with any control apparatus, specially packed for Water Works' use in improved and convenient cylinders, 105 and 150 lbs. net.

We can make prompt and regular shipments and shall be pleased to quote for spot and contract deliveries.

Our Gray Cylinders are devoted exclusively to Water Works Service, insist upon the GRAY.

CHLORIDE OF LIME

In 225, 300, 450 and 750-lb. drums. Strongest, quickest-settling, most uniform and reliable.

If you have a problem to solve advise us and get the advantage of the services of our Technical Department.

Vol. XXII THE AMERICAN CITY, April, 1920 No. 4

Entered as second-class matter, July 29, 1910, at the Post Office at New York, N. Y., under Act of March 3, 1879

Issued Monthly The Civic Press, Tribune Bldg., New York Price, 35 Cents: $3 a Year

VOLUME XXII NUMBER 4

The American City

NEW YORK APRIL, 1920

Does Your City Keep Its Gas Range in the Parlor and Its Piano in the Kitchen?

How a Zoning Law, Administered at Nominal Expense, Will Promote Orderliness in Community Development, Help Real Estate and Benefit the Entire City

By Herbert S. Swan

Secretary, Zoning Committee, New York; Consultant, Commission on Building Districts and Restrictions, Newark, N. J.; Consultant, Zoning Commission, Yonkers, N.Y.; Consultant, City Planning Commission, White Plains, N.Y.

Necessity for Zoning

MILLIONS of dollars will be spent within the next few years on new buildings in every growing city in the United States. This money may just as well be spent toward the permanent upbuilding of the community as upon hit-or-miss, haphazard growth involving endless construction, demolition and reconstruction without ever achieving any degree of finality. It won't cost any more; indeed, it will cost considerably less, and at the same time it will produce a much better city to live in and to do business in for generations.

The time to zone our cities is now. Every year that is allowed to lapse without the adoption of zoning means that much less zoning in the end. Here is a quiet residential street improved with private dwellings. If zoned now, this street may be maintained for detached houses. Wait until next year to adopt a zoning scheme, and the erection of two or three tenements will place it in the tenement-house class. The erection of a factory or a garage may even put it in an industrial zone. We must have zoning to protect what we have.

Mounting prices make it increasingly necessary to conserve the value of all buildings, old no less than new, from premature and avoidable depreciation.

Zoning expresses the idea of orderliness in community development. Just as we have a place for everything in a well-ordered home, so we should have a place for everything in a well-ordered town. What should we think of a housewife who insisted on keeping her gas range in the parlor and her piano in the kitchen? Yet anomalies like these have become commonplace in our community housekeeping. In what city can we not find gas tanks next to parks, garages next to schools, boiler shops next to hospitals, stables next to churches, or funeral establishments next to dwelling houses? What would be considered insanity if practiced in the ordinary house is excused as an exercise of individual liberty when practiced in the city at large. And yet misplaced buildings are to be condemned much more than out-of-place pieces of furniture.

The whole purpose of zoning is to encourage the erection of the right building in the right place. It protects the man who develops his property along proper lines against the man who develops his property along improper lines. Rightly understood, zoning means the substitution of an economic, scientific, efficient community program of city building for wasteful, inefficient, haphazard growth.

Courtesy of the City Plan Commission, Detroit, Mich.; Harland Bartholomew, Consultant

EXCELLENT EXAMPLE OF AN INAPPROPRIATE STRUCTURE WHICH VIOLATES ALL THE PRINCIPLES OF A ZONING PLAN—HEIGHT, AREA AND USE

Values of adjoining buildings are greatly depreciated. The invasion of such a structure in a residential district would be prevented by a zoning law

How to Get Started in Zoning

The first step in zoning is the enactment of enabling legislation. The exact legislation necessary in any particular state varies according to the degree of home rule exercised by cities. In some states where cities have very broad powers of home rule no enabling legislation is required. In most states, however, cities enjoy only such powers as have been specifically granted them by the legislature; the powers not expressly conferred upon them are denied. The vast majority of cities are probably in this situation.

After the enactment of the enabling legislation comes the appointment of the zoning commission. Experience has demonstrated that the best way actually to accomplish anything in the way of zoning is for the city to appoint, in the absence of a city planning commission, an unpaid commission of representative citizens, this commission having conferred upon it adequate authority, and money to engage the necessary expert help to make a comprehensive survey of the city and to formulate regulations and lay out districts controlling the height, use and area of buildings thruout the community. Having framed a tentative draft of the regulations and maps, the commission should hold public hearings. Notice of these hearings is generally given in the press, in the same manner as notice of any other proposed ordinance. The suggestions made by property owners at these hearings will prove of the utmost value to the commission in preparing its final reports, which when amended thus is submitted to the city council for consideration The council, of course, holds public hearings on the final maps and the ordinance reserving the right to amend either up to the time the regulations are finally enacted.

The Zoning Commission

The personnel of the commission is a constantly recurring problem to every city that embarks upon a zoning program; for the character and ability of the commission will determine as nothing else the success of the work. Shall the commission be composed of city officials, or of representative citizens engaged in various lines of work? The primary qualification for membership is that a man should enjoy the confidence of the community and that he should have considerable breadth of vision and a judicial attitude of mind. It is

what a man is able, and not only able, but willing and ready, to contribute to the zoning work that should determine whether or not he is put on the commission. No man should be appointed simply because he happens to be a city official, a prominent citizen, or a member of a prominent organization.

Too large a commission is not desirable. The difficulty of obtaining a quorum, the necessity for many committees, and the general shifting of responsibility accompanying large bodies all make a small commission more effective than a large one.

Even a large city will seldom, if ever, require a larger commission than fifteen. New York had sixteen; St. Louis, thirteen; Newark, eleven. A commission of seven would probably suffice for most cities of a hundred thousand. Towns of ten or fifteen thousand might actually find a commission of three or five adequate.

The knowledge of local needs can be obtained very much more satisfactorily thru conferences and meetings with interested parties, than by increasing the size of the commission. Neighborhood and taxpayer organizations are only too glad to appoint committees on zoning to coöperate with the commission in elaborating the regulations for different localities. For exact information concerning the height, use and area of buildings, however, the commission will be forced in the last analysis to rely upon the detailed data compiled by its staff. Many people may think they know all about their cities, but their knowledge cannot take the place of maps and charts classifying different kinds of buildings in defining the several districts.

Objections to Piecemeal Zoning

To be most effective a zoning scheme must be city-wide. Piecemeal zoning inevitably results in leaving a large part of the city unzoned, and the part zoned zoned without reference to the best interest of the city at large. When the whole city is zoned at one time, it is possible to treat all districts similarly situated and of like character in the same manner. When one section of the city is zoned at a time, this is very difficult, if not quite impossible. Each locality being studied separately, the regulations adopted will, of course, be drafted to suit the idiosyncrasies of the local development. A comprehensive survey embracing the entire city would, however, reveal the presence of dozens of localities, each perhaps slightly different yet sufficiently alike to be treated together as one class. The establishment of a multiplicity of kinds of districts, when a few would suffice, serves no good purpose; it only creates confusion and tends to bring all zoning into disrepute.

Courtesy of the Philadelphia Zoning Commission.

THE OVERSHADOWING GAS TANK IN A RESIDENCE DISTRICT

There is also another point to be considered, and that is the attitude of the courts toward zoning. In order that the ordinance passed may have its legality sustained, it is especially important that every care be exercised in framing the proposed regulations so that they fit local conditions, that they are not arbitrary or discriminatory, and that they do not fall within the ban of class legislation. Above all, reasonableness must be the test of both the classification and the districts established. Whether the legality of any particular zoning scheme will be sustained depends more upon the carefulness and fairness put into the preparation of the regulations than upon a lack in the forward-looking attitude of our highest court.

Temporary Ordinances Undesirable

The question of passing a temporary ordinance protecting residential districts, appears to come up whenever a city considers the adoption of a zoning ordinance. Once appointed, the zoning commission will be repeatedly urged to formulate restrictions for certain localities before completing plans for the entire city. This the commission should consistently refuse to do, for when the legality of the law is tested in the courts, the city will be in a much stronger position to defend the scheme if it is able to say that all the regulations are mutually interdependent and part of a common plan. Of course, it is hard to see sections ruined while protective measures are being formulated, but the harm done in this respect will prove very small. If the commission concerns itself with special districts at the start, the injury done in the city at large, due to the later adoption of the plan, will no doubt be much larger in the aggregate than the benefits conferred upon a few scattered residence districts temporarily protected. There are also other objections to temporary ordinances. Such regulations having once been imposed, the owners in such sections of the city are apt to consider themselves adequately protected and to lose all interest in the final working out of the plan. A tentative plan, moreover, is likely to prevent the erection of buildings in sections where they would be allowed in the final plan. Persons who have their building projects interfered with in this manner will naturally be more or less disaffected and oppose the enactment of any regulations.

Limitation of Congestion

It is a strange phenomenon that despite a half-century fight against bad housing conditions, congestion of population should proceed at an accelerated rate in many cities. More improved and enlightened housing legislation may have effected higher sanitary standards in the environment surrounding the home, but it has not checked the ever-increasing concentration of population. Indeed, to a degree, it has even seemed that this overcrowding of the land was due to the very measures which were designed to improve conditions.

In New York, for instance, new bridges and tunnels have only extended the congested area. The rapid transit lines extending far out into the cornfields have not dispersed the population. Bridges over the rivers, tunnels under the rivers, and subway and elevated lines everywhere gridironing the metropolitan district have all helped, each in its turn, to create new congested centers in the purlieus of the city.

How to control congestion is probably as important and difficult a problem as any that confronts some cities to-day. Height regulations afford no satisfactory solution to the question, for even tho the height limits adopted be as low as it is practicable to impose, the fact remains that a large number of families can be housed in low buildings. Nor will area regulations get to the bottom of the matter, for the court and yard requirements will usually be found to admit of the construction of a fifty-family house as readily as the erection of a three-family house. To prevent an undue congestion of population, it is becoming increasingly clear that it is necessary to go beyond the imposition of height and area regulations.

Experience shows that in the absence of any restriction on congestion there is practically no limit upon the population that can and *will* be housed on a unit of ground In New York, for instance, the new tenements now being erected accommodate a larger number of persons on a given land area than any of the old slum houses on the east side. The average density of the tenements erected in Manhattan in 1914 was 852 persons per acre (counting 4.6 persons to the family). In Brooklyn for the same year it was 697 persons per acre. The maxi-

mum density was over 1,600 per acre. These figures in each case refer to the land within the block, exclusive of that in streets. Statistics show that the maximum is rapidly becoming the average.* In 1914, there were 119 tenement houses containing 4,125 apartments erected in Manhattan. These apartments, which provided accommodations for a population of 18,975 persons, occupied by actual measurement, a land area of only 22¼ acres. Making due allowance for the area within streets, this size of the lot. Thus in the A and B districts the limit expressed on an acreage basis is 140 families; in the C districts 105 families; and in the D districts 25 families. This is equivalent in the A and B districts to 8 families on a 25 x 100-foot lot, in the C districts to 6 families. In the D districts it is equivalent to 2 families on a 35 x 100-foot lot. A family is defined as any number of individuals living and cooking together on the premises as a single housekeeping unit.

Courtesy of the City Plan Commission, Detroit, Mich.; Harland Bartholomew, Consultant

A ZONING LAW WOULD HAVE SAFEGUARDED THIS RESIDENCE DISTRICT FROM INVASION BY A GARAGE COVERING ITS ENTIRE LOT AND VIOLATING THE BUILDING LINE

is at the rate of over a half-million population per square mile.

To remedy this evil, the Newark ordinance, therefore, prohibits any dwelling or tenement house hereafter erected from accommodating or making provision for more than a given number of families. The number in any particular case varies according to the district and the

In Newark, and in eastern cities generally, the problem is very much more than one of preserving detached house districts. The one-family row house and the multi-family house undoubtedly harm the private detached house, but the same can be said of the big tenement alongside the two- or three-family house. The establishment of one-family detached house districts, tho it limits land-overcrowding in these districts, does not restrict it in those parts of the city left open to apartments. There the owners would be allowed to pile up as many apartments as they might choose.

* For an exhaustive discussion of this subject, see "Land Overcrowding in Brooklyn," a report prepared by Herbert S. Swan for The Tenement House Committee of the Brooklyn Bureau of Charities and The Brooklyn Committee on City Plan in 1916.

Effect of Home Environment Upon Social Conditions

Keeping all kinds of industry out of residence districts is expected to go a long way in improving social conditions, for zoning offers at one stroke, without any expense or any increase of rents, a method of protecting such housing standards as we have achieved against steady deterioration. It does more than that: in defining the direction and character of city growth, it lays the basis for an ever-increasing improvement in the social and economic conditions affecting the whole community.

Never has the intimate relationship between good housing and successful industry been plainer than it is to-day.

The stabilization of employment conditions and the reduction of labor turnover are dependent to a large extent upon what improvement can be effected in industrial housing. So long as no protection is thrown about the environment of the workman's home, so long as it is allowed to be hemmed in with manufacturing establishments pouring out grime, dirt and smoke, we can expect slums filled with hordes of unskilled nomads who wander from plant to plant and from town to town, not only taking no interest in our civic life but bearing towards our institutions the keenest resentment. If the housing of munition and shipyard workers has taught us nothing else, it has taught us that a most intimate relation exists between social unrest and bad housing.

To man the works we must house the man, but the environment of the house is of almost as much importance to the works as the house itself. If there is no house, the man cannot be housed; if the house is not situated in a congenial neighborhood, the man will not want to live in the house.

Benefits Conferred Upon Industry by Zoning

How zoning can be made of as great help to industry as to residence and business is well illustrated in the case of Alameda. Since the adoption of its zoning ordinance the city has commenced the construction in its industrial district of a belt-line railroad, which will serve all factories, connecting them not only with each of the several railroads, thus relieving the factories from domination by any one railroad, but with the water-front, so that freight can be floated across San Francisco Bay in car-load lots. A highway, nowhere less than 100 feet in width, skirting the edge of the industrial district thruout the length of the city, has also been planned. Laid out for the purpose of facilitating the movement of factory traffic, this street will be improved in such a manner that its pavement will stand up under heavy loads and endure hard wear. The protection of the district against fire, too, is being looked into by the city. So long as factories were allowed to locate anywhere in the city, it was difficult to serve them with sufficiently large water-mains. But, now, as factories can in the future be located only in one district, the city can readily afford to give them all the fire protection they need.

That the relative competitive strength of a city in the domestic and foreign markets of the world is frequently conditioned to quite as great an extent by the arrangements of the industries within the city as by the availability of raw materials and the proximity of a consuming public, is just beginning to dawn upon us.

When factories and warehouses are not located with reference to freight terminals, a situation frequently develops where the down-town streets are unnecessarily congested, to the inconvenience and financial loss of the whole city. A similar condition results where mutually interdependent industries locate in widely separated parts of the city instead of near one another. It is maladjustments of this kind that zoning is designed to remedy.

Among cities similarly situated as to markets and raw materials, it is the city in which manufacturing can be carried on with the lowest overhead expense that will be the most prosperous. The city that drones along and does nothing to promote its industrial development is, in effect, encouraging grass to grow on its own streets.

That a program of industrial zoning and development is essential in every city cannot be questioned. For years the pecuniary losses suffered on account of unregulated building in certain cities have not only equalled but exceeded those suffered from fire. The city that does not protect its citizens against fire is generally considered derelict in its sense of public duty. The same is rapidly becoming true of the city that does not protect its citizens against unregulated building.

Public Docks a Wise Municipal Investment

A Description of the Port Equipment at Astoria, Oregon

By C. I. Barr
Secretary, Astoria Chamber of Commerce

IN 1909 the people of Clatsop County, which embraces an area of 821 square miles, voted by a large majority to found the Port of Astoria at the mouth of the Columbia River and to create a commission to launch and maintain their claims upon the maritime interests of the world. The port development is now accounted as first among the real assets of the Lower Columbia District, is already a paying institution and will unquestionably serve the municipality and the state well in the days following the reconstruction period.

An examination of a chart of the Pacific Coast will show that on the coast-line between San Francisco and the Strait of Juan de Fuca the only harbor for deep-draft vessels is at the mouth of the Columbia River. Here the city of Astoria is located, with a population of 30,000 people, on a peninsula bounded on the north by the great Columbia River, and on the south and west by Youngs River and Youngs Bay. It is a port that must grow in maritime prominence as the Pacific Coast of America develops in its relation with the rest of the world.

The first action of the Commissioners was the examination of the harbor within the port district. A careful study of the terminal site was outlined, and in the spring of 1913, 56 acres of land were purchased on the main channel of the Columbia River and actual work was begun on the construction of the terminals.

The Port of Astoria possesses one of the best harbors on the Pacific Coast, which has an entrance of 40 feet of water at low tide in a channel 3,000 feet wide, and for a width of approximately 1,000 feet an entrance of 42 feet at low tide. The anchorage is good thruout; there are 12 square miles of anchorage ground over which the depth is from 24 to 70 feet at low water, and for 8 square miles the depth is from 30 to 70 feet at low water. It is a fresh-water harbor, and by the construction of a jetty is protected from the ocean's swell, which makes the stream navigable the entire year.

During 1918 the site of the Port of Astoria was increased to 304 acres, and the new acreage is now being devoted to modern schemes of improvement that will make it one of the finest marine depots on the coast of America.

The Port Facilities

On Pier No. 1, which is 1,300 feet long, with a frontage of 620 feet, is located a warehouse 90 feet wide and 1,300 feet in length, built "L"-shape of hollow building tile, which, aided by the automatic dry-pipe sprinkler system and stand-pipes, carries a low rate of insurance. Along this pier there is 37 feet of water at low tide. Our average tide is 7 feet 5 inches. On this pier is also located one of the largest bulk grain storage plants on the Pacific Coast, with a capacity of 1,250,000 bushels. We have installed the latest machinery, which is all electrically driven and is capable of handling 15,000 bushels per hour. The elevator consists of 108 bins, 38 of which are 76 feet high and 22 feet in diameter, holding 24,000 bushels each. This elevator offers great inducements to the wheat-producing section of the Northwest.

Adjoining the elevator the Port has erected a six-story flouring mill, which has a daily capacity of 4,000 barrels and is equipped with the latest type of flour-making machinery. This mill along with the flouring mill already in operation gives Astoria a daily output of 5,200 barrels, which means that about 20 car-loads of wheat per day are required to keep these two mills in operation.

On this pier are operated eight electric conveyors, which are capable of handling tonnage to and from vessels at the rate of 100 tons per hour each. Electric ramps and Brown portable pilers, along with ample trucks, slings and sliding boards, are

A PANORAMIC VIEW OF THE

available at all times. This pier will accommodate 100 cars having an, average length of 40 feet.

Pier No. 2, which is an open pier used for the assembling of lumber, coal and other commodities of this nature, is 1,445 feet in length with a frontage of 426 feet. Upon this pier are operated three locomotive cranes having a capacity of 50, 30 and 25 tons respectively. A coal bunker is located here which has a bunker storage capacity of 3,000 tons and a loading-out capacity of 175 tons per hour. Open storage for coal is also available up to 20,000 tons. The rate for handling coal from the bunker to the ship's bunker is 35 cents per ton; storage charges 10 cents per ton on open platform and 25 cents per ton in the bunkers. A wharfage charge of 15 cents per ton is made, which includes 15 days' free storage. This pier is especially adapted for the storage and handling of lumber cargoes up to three million feet BM with equipment capable of handling 100,000 feet BM per hour.

Between Piers 1 and 2 a gridiron has been provided for the loading and unloading of locomotives and such equipment on their own wheels, and for the repairing of barges and other small crafts.

Pier No. 3, which is now under construction, is 1,750 feet long, with a frontage of 550 feet. Upon this pier will be located an import and export shed which will be 1,575 feet in length and 160 feet in width. At the present time the import shed is being constructed, and will be ready for use in about five months. This freight shed will be of reinforced concrete, and will have four electric cargo cranes, as well as tractors, trailers, conveyors and other equipment necessary in expediting the movement of freight. Along this pier there is a depth of water of 40 feet at low tide.

The Port of Astoria owns and operates a belt line railroad, which is 4 miles in length and serves industries located along the water-front, and which has also opened up a frontage for the location of new industries. Along this belt line railroad a steam car electric producing plant is being constructed by the Pacific Power & Light Company, at a cost of $750,000.

The Port of Astoria has a frontage of 8,940 feet and a total of 8,778 feet of berthing space. The three piers aggregate a total area of 865,676 square feet. The total amount of money expended by the Port and under construction will aggregate $3,750,000.

The Columbia River, according to statistics from the various lightships, has less fog-bound hours than any other Pacific Coast port. The dredge "Natoma," which is a 20-inch suction dredge, is owned and operated by the Port of Astoria, and is used in deepening the channels of the Columbia River and its tributaries. This enables us to accommodate the largest draft vessels on the Pacific. The dredge is also used in preparing sites for industries locating in this district.

The handling charges of the Port are

MUNICIPAL DOCKS OF ASTORIA, OREGON

lower than those of other Pacific Coast ports, and greater inducements are being offered new steamship lines here than are likely to be found at any other Pacific Coast port. Vessels stopping at this port eliminate the pilotage and towage charges up and down the Columbia and Willamette River, and also save two or three days' time. Astoria has transcontinental freight rates, as do other Pacific Coast ports.

The charges assessed commodities handled over our piers are: wharfage 30 cents, storage 40 cents, loading and unloading 60 cents, handling 60 cents; all are per ton of 2,000 pounds. The wharfage charge allows 20 days' free storage.

Just recently the United States Transport "Marica" was forwarded to Portland, Ore., for a cargo of flour, but owing to her draft of 32 feet she was unable to continue her loading there on account of insufficient depth of water in that harbor, and she was returned to the Port of Astoria for the completion of her cargo. This alone will show that the Port of Astoria is capable of taking care of the largest vessels operating from any Pacific Coast port.

During January, 1920, a total of 24,427,661 feet of lumber was exported from the Astoria district. This district contains one-sixth of the standing timber in the state of Oregon, or approximately 18 billion feet. During the year 1919, the Columbia River Bar Statistics show that there were 768 vessels entered and 899 vessels cleared; also 3 log rafts containing 18,000,000 feet of logs cleared. The Astoria Flouring Mills forwarded 286,996 barrels of flour for foreign delivery with a valuation of $2,869,960. The U. S. Grain Corporation forwarded 626,022 bushels of bulk wheat for foreign delivery; value $1,865,055. This cargo was the first shipment of bulk wheat made from the Columbia River, and was loaded aboard the steamer "West Islay" on July 29, 1919. Final destination of this shipment was St. Nazaire, France. There were shipped to California points 11,125 sacks of flour and 34,535 cases of canned salmon.

Many places are awaiting development to-day and do not proceed for lack of definite plan and of a policy showing the attitude of the governing body. This hesitancy has the effect of throttling any initiative in the expenditure of money by private interests. There are, undoubtedly, many places whose water-fronts, on account of uncertain ownership and lack of plan, are idle, which might be developed if public control was established.

New Garbage Collection and Disposal System in Utica, N. Y.

Municipal Collection and Contract Feeding to Hogs Supplant Contract Collection and Reduction, with Beneficial Results

By George D. Shay

IN April, 1919, Utica, N. Y., began the municipal collection of garbage by means of motorized equipment. This has not only effected a large saving in the matter of cost, but has brought about that which is far more important, in the opinion of municipal authorities and householders alike—a prompt and efficient collection of the garbage of the city.

For many years the collection of garbage in Utica was under private contract and by means of wagons and teams, under the supervision of the Department of Health, inspectors from the Department checking up the collections. At its best the private contract method was never satisfactory. Daily complaints of the non-collection of garbage, oftentimes running up into the hundreds, were received at the Bureau of Health.

During the winter of 1918-19 acute labor conditions forced the garbage contract firm to petition the city of Utica to be relieved of the contract. The Common Council granted the petition, not alone to save the contractors from bankruptcy, but also to relieve a situation which had become unbearable, as the result of the contractors' being unable to carry on their work. It was then, at the suggestion of the Commissioner of Public Works, Harry R. Hayes, who had made a study of the question, that the city decided to take over the collection of garbage.

On January 1, 1919, the contract for the disposal of city garbage expired. This contract had been held for many years by Henry Stappenback & Sons, who owned and conducted a large reduction plant on the outskirts of the city. When new bids were called for, this firm, whose contract price had been $4,100 for disposal, raised its bid to $8,000 per year. A new firm, Sauer & Hameline, which had established a pig farm outside of Utica, presented a bid for $3,100. The contract was awarded to the lower bidder, the city thus effecting a saving of practically $5,000 a year.

The Collection System

As the farm of the new contractors is located about four miles from Utica, the problem of a long haul was successfully solved by the introduction of motorized equipment.

The city purchased sixteen 3½-yard side-dump Lee trailers, and two 5-ton White motor trucks for the long-haul work, and eight teams of horses for the collection work. This equipment was received in April, 1919, and was immediately put to work under the following system: At 8 o'clock each morning, the eight teams with trailers start from the central station and work the zones allotted to them. These units are at work until the trailers are loaded, when they are exchanged for empty trailers at specified points in their zones. It was found that it required from 1½ to 2½ hours to collect a load of 3½ cubic yards, depending upon the zones. Accordingly, the tractors leave the barn not before 9 o'clock each morning, each with a train of four empty trailers which are exchanged for the loaded trailers at the specified transfer points. The tractors then take their trains of loaded trailers to the pig farm.

The efficiency of this system is at once apparent, as the teams are engaged in the work for which they are best fitted, namely, the slow-speed collection or house-to-house work, while the tractors are doing the long haul.

Two men accompany each team and trailer on the collection from house to house, and a truck driver and one helper work on the trailer trains transporting the garbage to the disposal farm. The drivers of the trucks receive $3.50 a day each, while the other employes receive $3 per day. The average work day consists of about six hours, and the men collect during that time from 35 to 40 tons of garbage. The average cost per ton collection and disposal for the months of May, June and

A MOTOR TRUCK WITH ITS TRAIN OF TRAILERS READY FOR THE LONG HAUL TO THE FARM

July, 1919, was $5.40. This, in comparison with the old method and cost of collection, shows a saving to the city of approximately $5,000 per year. In addition, there is the matter of efficiency. Under the old system there were numerous complaints about the reduction plant, which was located upon the outskirts of the city, yet adjacent to a residential section. Since the inception of the disposal farm no complaints have been received against it. During August, 1918, 500 complaints were received of the non-collection of garbage from wrathful householders, and on an average 260 complaints a month were received. Under the new system 26 complaints has been the maximum for any one month.

The drivers and collectors take great pride in their equipment, and small cash prizes for the best records of collections are offered monthly, which greatly stimulate competition among the men. The labor, which is usually a difficult proposition on this class of work, is readily secured, and the men have proved unusually honest and faithful.

Many of the drawbacks of the old system have been eliminated. The trailers, tho of 3½-yards capacity, are only 4 feet 11 inches to the loading edge, thus reducing the actual lifting work to a minimum. This means a great deal to the men engaged in collection, in comparison with the high-sided garbage wagons of the old system.

The whole system has now been worked out in complete detail and the city zoned for convenience. As the work has progressed, the efficiency of the system has increased to a point where regular schedules and times are known to the foremen, and now a loaded trailer rarely waits more than five minutes for the transfer.

The last collection of the day is, of course, taken directly to the central barns, as otherwise the teams would come in with no load, and the transfer to the tractors is made at the barns.

The system has proved satisfactory from every standpoint, and the householders are especially well pleased, for the reason that they are now served twice a week, whereas under the old system the collections in a district were but once in every ten days.

The Disposal Farm

The disposal farm consists of about 160 acres, and at present some 1,600 pigs and a flock of 200 sheep are being fed. It was found upon trial that sheep eat refuse of the character brought to the disposal farm with as much zest as the pigs, and evidently with as good results.

In collecting the garbage, care is exercised that no glass or other substances likely to work injury to the pigs or sheep are brought to the farm. To guard against this danger, the Common Council of Utica enacted an ordinance fixing heavy penalties for conviction of any person or persons placing in the garbage any foreign matter, such as glass, tin cans and the like. The ordinance also provides that all garbage must be delivered in proper receptacles only to the authorized city collectors.

At the farm an expert in the breeding of pigs is employed as superintendent, also a veterinary surgeon, and in the breeding, feeding and housing of the animals a high standard of excellence is maintained, so that the danger of disease is reduced to a minimum.

The large breeding pens at the farm are divided into small pens about 8 x 12 feet in dimension. In these the sows breed and remain with their litters until weaning time. The young pigs are then kept in the breeding pen until able to care for themselves, when they are removed to the feeding colonies in the pastures.

When the garbage arrives in the trailers at the farm it is unloaded from each trailer into a long chute, which conveys it to a point where it is run thru a process tending to remove all dangerous foreign substances. It is then hauled by wagon to the several feeding colonies.

The breeding pens are a remarkable sight. They are divided by long alleyways thru which the expert passes constantly upon his rounds, examining all pigs and their litters for signs of disease. Since its inception, thousands of persons from Utica and elsewhere have visited the pig farm, the first of its kind in this section of the country. Many city officials, too, interested in the plan, have come to Utica from different parts of the country to make a study of this method of garbage disposal and of the motorized equipment for collection.

Comparison of Old and New Systems

The following comparisons between the municipal system and the old contract system for the months of April to November, inclusive, in 1918 and 1919, are of interest. Under the contract system for these months there was collected 5,000 tons of garbage. For the same period this year there was collected 6,283 tons. The average cost per ton-mile of haul under the contract system was $2.36, while under the municipal system of collection the average is $1.26. Under the old system the collections averaged three per month; under the present system, since April, 1919, thruout the entire city, collections are made twice a week, and from the hotel and business sections a collection is made every day. The total number of complaints received from April to December, 1918 (old system) was 1,350, while during the same period in 1919 (new system) but 158 complaints for non-collection were received.

The tractors have covered 10,998 miles since the municipal system was started. As a percentage summary, this indicates that under the municipal system there is a 30 per cent increase in collection tonnage over the old system, with an increase in length of haul of 150 per cent; also an increase in the number of collections of about 170 per cent; a decrease of 48 per cent in the cost per ton mile, and a decrease of 90 per cent in the number of complaints for non-collection.

DUMPING GARBAGE AT THE HOG FARM ONTO CHUTE FROM TRAILERS

Water Softening and Filtration at McKeesport

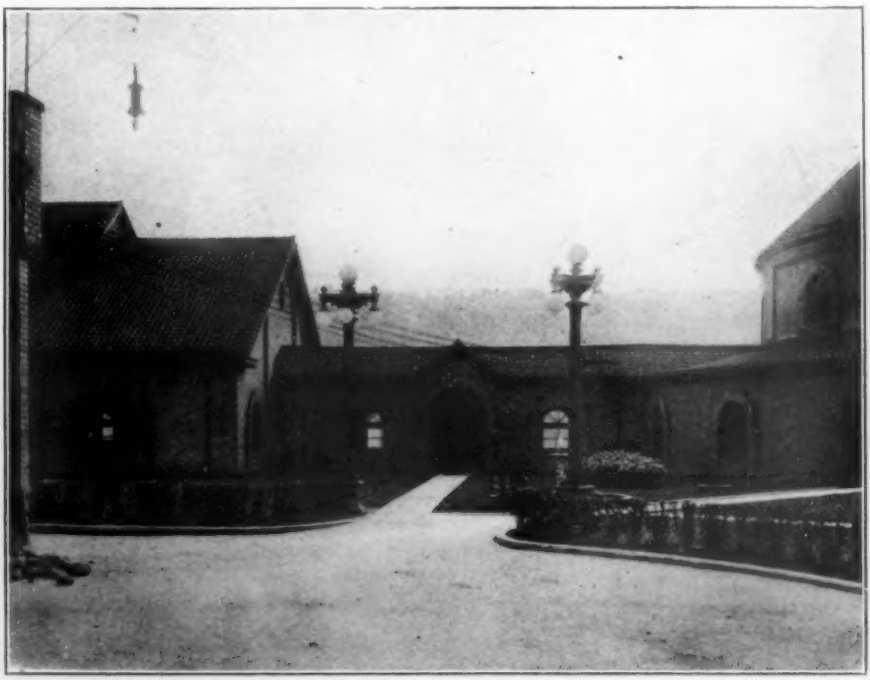
Unusual Conditions of Raw Water at Municipal Plant Necessitate Wide Variation in Treatment

By Edward C. Trax
Chemical Engineer, McKeesport, Pa.

THE city of McKeesport is located in Allegheny County, Pa., at the junction of the Youghiogheny and Monongahela Rivers, at a distance of fifteen miles by river above Pittsburgh. The public water-supply is furnished by a municipally-owned water-works system comprising raw water pumping stations on the Youghiogheny and Monongahela Rivers, a water softening and filtration plant, pumping equipment and a distribution system to deliver the purified water to the consumers.

The first public works to supply water to McKeesport were constructed in 1881. The works consisted of a distribution system, a reservoir at the site of the present distributing reservoir, and a power and pump plant on the east shore of the Youghiogheny River at a point one mile above the junction of the two rivers. Practically all of the original pipe system is still in use. The reservoir, having been enlarged and lined with concrete, and the power and pump plant, having undergone changes and additions from time to time, form parts of the system of to-day.

The water in the river was satisfactory according to the standards of early days, and the intake and pumping station were placed at a point which then appeared to be the most convenient and suitable location. Because of a lack of thoro under-



ENTRANCE TO THE McKEESPORT, PA., FILTRATION PLANT

standing or appreciation of the influence of water-supply upon the prevalence of certain diseases, and also because the river water was usually clear and free from odors and tastes, this supply was considered satisfactory for some years.

The Youghiogheny River, the largest tributary of the Monongahela River, is about 125 miles in length and drains an area of approximately 1,800 square miles. It rises in Preston County, W. Va., and flows in a generally northerly direction, emptying into the Monongahela at McKeesport. The watershed is mountainous, and the run-off is unusually large, especially of late years, as the country has been largely denuded of its forests. This results in floods and in low flow in dry weather, and is partly responsible for the violent changes in flow and in quality of the water.

The Acidity of River Water

The river drains a large part of the district known as the Connellsville coke region, and the activity in the vast coal and coke industry resulted in a gradual increase in the discharge of acid mine wastes into the river and its tributaries as more and more mines were opened. Drainage from coal mines is almost invariably highly mineralized; in addition to the salts of aluminum, calcium, lime, magnesium, etc., it usually contains considerable iron in various stages of oxidation, and free sulphuric acid formed by the action of air and moistures on the iron pyrites, present in varying quantities in connection with the coal veins. Alkaline mine waters are by no means rare, altho they are rather unusual.

The effect of a small proportion of mine water in a stream is to lower the natural alkalinity. As the proportion increases, the alkalinity is entirely neutralized and the water becomes acid. The flow of the mine drainage is much more constant than the flow of the stream, which is widely influenced by conditions of rainfall and run-off. The effect of the acid is much more noticeable when the river is low and the mine water consequently less diluted with fresh water. Manufacturing wastes from plants connected with the iron and steel industry may at times add slightly to these conditions in the streams of this district, but it is believed that the effect of these wastes is almost negligible. It has been estimated that not more than 5 per cent of the acid-iron pollution is due to such manufacturing wastes.

The water in the Youghiogheny River passed thru the various stages described as the amount of mine water discharged on the watershed increased. At first it was only during especially low flow in the river that the water was acid at McKeesport. With the increase in the amount of mine wastes the water has continued to increase in hardness and acidity to the present time. For a number of years the water has been acid at all times except for a few days following heavy rains, when the river is high. During the course of this change in the stream a point was reached where fish could no longer live in the water, and they entirely disappeared from the river below Connellsville a number of years ago. The records for seventeen years show that the acidity has varied from 0 to 390 parts per million. The maximum and average for each year is shown below:

FREE SULPHURIC ACID IN THE YOUGHIOGHENY RIVER AT McKEESPORT

Parts Per Million

Year	Maximum	Average
1902	204	36
1903	145	30
1904	162	48
1905	72	27
1906	106	23
1907	65	19
1908	240	63
1909	210	31
1910	390	81
1911	180	30
1912	140	30
1913	305	34
1914	280	56
1915	170	24
1916	165	32
1917	195	46
1918	250	55

Besides containing free acid, this water is very hard and holds a large amount of iron in solution. It is very corrosive in its action on piping and plumbing, stains bathroom fixtures, and is unfit for laundry purposes on account of the iron, which leaves yellow stains on white materials washed in the water. Before the purification of this water in 1908, McKeesport was supplied with probably the worst water of any city of its size in the country. A U. S. Government bulletin published in 1906 stated: "It is evident that McKeesport is supplied with a water that is dangerous and in no sense potable or fit for consumption by human beings." The corrosive action of this fluid on pumps and plumbing fixtures was so severe that at times of bad acid conditions it became almost impossible to supply water,

and at one time the leakage amounted to 50 per cent of the water pumped. Typhoid fever was prevalent in the city, and was attributed both to the public water-supply and to polluted wells and springs, which were largely used for drinking water on account of the bad condition of the city supply.

Improvement of Water-Supply

In order to bring about some improvement in the condition of the water, a series of wells were drilled along the river shore near the pump station. The well water was very hard, contained a large amount of iron, and was not satisfactory bacterially, but was used for several years to dilute the water from the river, thereby decreasing the acidity somewhat. This supply was used without treatment until 1908. From time to time there was considerable agitation, and several studies were made as to improvements for relief from these conditions. After investigating the merits of the various suggestions for better water, it was finally decided to build a plant to purify the Youghiogheny River water. This was done accordingly, the present water softening and filtration plant being constructed in 1907-8, and placed in operation, October 11, 1908.

The result was little short of marvelous; from the worst water in the country McKeesport changed over night to a supply second to none. The water is soft, as water-supplies go in this district, clear and sparkling, free from color, turbidity, objectionable substances and harmful bacteria, and is entirely safe and suitable for drinking and domestic purposes. It is true that when a water requires heavy treatment with lime and soda ash sufficient sodium sulphate may be formed to produce a somewhat flat or alkaline taste. This taste is not usually considered unpleasant and is rarely noticed by regular users of the water. In fact, after becoming accustomed to drinking softened water, many considered it more palatable than other supplies. The fact that the softened municipal supply in McKeesport, which has been at times probably the most heavily-treated domestic supply in the world, is used almost exclusively for drinking purposes in the city, is very strong proof of the potability of a softened water. It is

THE MAIN BATTERY OF FILTERS OF THE McKEESPORT WATER-WORKS

entirely free from the earthy or fishy taste noticed in many surface supplies, and there seem to be no disadvantages or objections to the water for drinking. It is believed that in no city is the public supply more generally used for drinking and the per capita consumption of bottled table water so small.

After the purification process was in operation, many people continued to drink water from polluted wells, which was a source of much concern to the health authorities and, undoubtedly, the cause of many cases of water-borne diseases. A campaign of education was waged against this practice; people were urged to visit the purification plant, which was always kept clean and attractive and where the purification of the water was explained. The public press also assisted very materially.

In addition to this, analyses were made of all well waters used for drinking in the city, and wells proving unsafe were closed, locks being placed on the pumps where necessary.

These measures resulted eventually in the almost universal use of the public supply for drinking purposes, with a very gratifying effect on health conditions in the city. Typhoid fever has almost disappeared; the number of cases has been reduced from a maximum of 512 in 1906 to 13 in 1918, and the death rate from this disease from a maximum of 129 deaths per 100,000 population in 1904 to 4 per 100,000 in 1918.

Treatment of Youghiogheny River Water

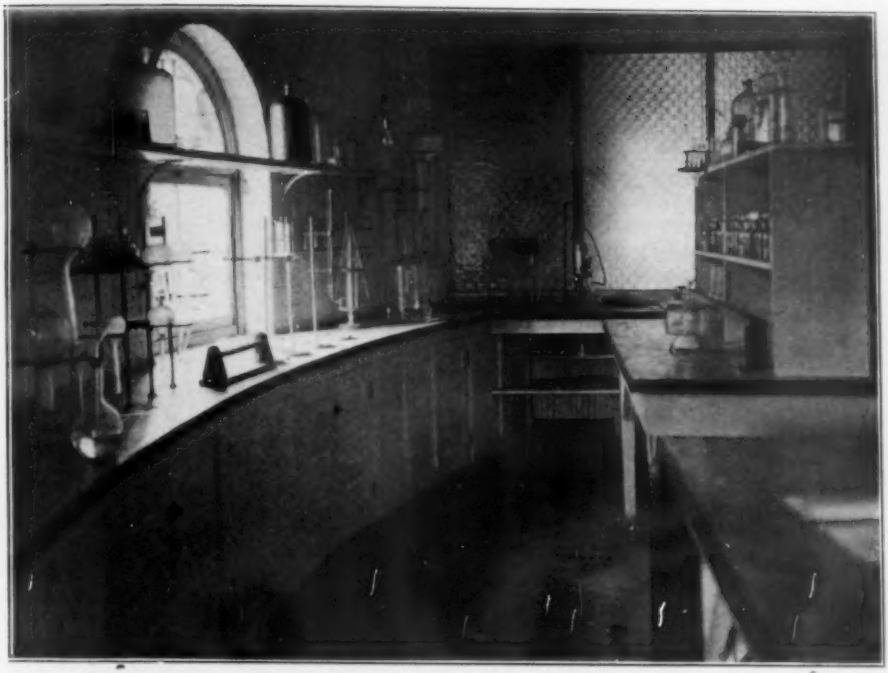
The treatment of the raw Youghiogheny River water has required at times enormous amounts of chemicals. The lime used has varied from 100 to 3,800 pounds per million gallons of water treated, and the soda ash from none to 7,000 pounds per million gallons. The average amount used during the entire period of operation of the softening plant with the Youghiogheny River as a source of supply, has been 866 pounds of lime and 1,450 pounds of soda ash per million gallons. The cost per million gallons was $3.03 for lime and $11.72 for soda ash, making a total of $14.75.

On account of this high cost for chemicals, studies of the condition of the Monongahela River near McKeesport were commenced in 1910, analyses of the water being made almost daily. These studies showed that a large saving in chemicals could be effected by building an intake in the Monongahela River above the inflow of the Youghiogheny and pumping the raw supply from this source to the purification plant, a distance of about two miles. A report was made to the Board of Water Commissioners in 1912, recommending the building of this new intake as a matter of economy. The report was approved by the city authorities but no steps were taken for the immediate carrying out of the project. The general satisfaction with the softened water was so great that it was considered unwise to make a change which was regarded by some as more or less of an experiment. With the outbreak of the world war, however, the price of soda ash became prohibitive to use in the quantity necessary to satisfactorily soften the water from the Youghiogheny River, and the building of the new intake was no longer a matter of good policy, but an actual necessity. Emergency measures were passed by the City Council, providing for the quickest possible execution of the work.

Further Improvements in Supply

This improvement consists of an intake and low-service pumping station along the east shore of the Monongahela River about a mile above the point where the Youghiogheny River joins it. From this station the water is pumped thru a 24-inch cast iron main to the purification plant. This station was ready for operation in August, 1916, and since that time water from the Monongahela River has been used almost exclusively. In the three years the new intake has been in operation, the saving in chemicals has been sufficient to pay double the cost of the improvement.

The Monongahela River is also subject to pollution from coal mines and manufacturing plants. This pollution is very objectionable, and at times expensive to remove; but the expense is in no sense comparable to that of softening the water from the Youghiogheny River. One serious pollution encountered in the Monongahela River has been the disagreeable taste and odor imparted to the water at times by wastes from by-product coke plants located on the river a short distance above the new intake. These characteristic and very unpleasant tastes and odors cannot be removed from the water by any practicable method of treatment, and have been a source of considerable objection to the supply by users



THE MAIN CHEMICAL LABORATORY, WHERE THE PROCESS OF SOFTENING AND PURIFICATION IS CLOSELY WATCHED AND CONTROLLED

of the water. With the coöperation of the State Department of Health, and the officials of the manufacturing plants, the pollution has been reduced to a minimum, and little further trouble from this source is anticipated. In all other respects the new supply has been fully as safe and satisfactory as the softened Youghiogheny River water.

Wide Variation in Character of Water

The purification of these acid waters is beset with no special difficulties, the principal disadvantages being the great cost for chemicals and the extreme variability of the mineral content of the water. The character of the water in the Youghiogheny River is changing constantly, and variations in hardness and acidity of from 100 to 300 parts per million in the course of a few hours are by no means unusual. The iron in solution amounts usually to from 5 to 75 parts per million, equivalent to from 1 to 22 grains per gallon of crystallized ferrous sulphate, and there is also present considerable aluminum sulphate. The usual method of treatment for clarification is therefore reversed, it being necessary to supply alkalinity in the form of lime and soda ash to neutralize the acid and precipitate the iron and aluminum. The iron and aluminum are present in large excess of the amount necessary to completely coagulate the water, and the natural result of this excessive coagulation is a high percentage of removal of turbidity and bacteria in the settling basins. This accounts in part for the high bacterial purity of the city supply since the softening plant has been in operation.

Another factor which exerts a wide influence on the bacterial life is the germicidal action of the acid and iron salts in the rivers. Considerable sewage is discharged above the intakes in both rivers, and during alkaline conditions in the streams the bacterial numbers run very high, with B. coli present in 1/100- to 1/10-cubic-centimeter portions. As the water reverts to its normal condition of acidity, the numbers of bacteria fall off very rapidly, with tests for B. coli negative in 10 cubic centimeter portions. In the year 1910, during which the conditions of flow and acidity in

the Youghiogheny River were more variable than usual, the number of bacteria in the river water varied from 0 to 485,000 per cubic centimeter; on 25 days no colonies developed on gelatine plates incubated 48 hours, at 20 degrees C. During a period of more than three months B. coli were not found to be present in 4 to 10 cubic centimeter portions, altho chemical examinations indicated gross sewage pollution.

Natural Coagulation in Streams

Another influence active in the removal of bacteria, which is a direct result of the presence of the mine drainage, is the coagulation and sedimentation which takes place in the streams, especially during low acidity. Some of the iron and aluminum sulphates present are precipitated as hydrates by the first mingling of the mine water with the alkaline water of the stream, or by the inflow of small alkaline streams when the main body of the river is acid. The water is thus coagulated, and as the precipitates settle out they carry many of the bacteria with them. The appearance of the streams at such times is brownish yellow in color, or sometimes mottled, greenish streaks and blotches appearing as the precipitates begin to settle out. It has long been known that the Monongahela River near Pittsburgh, altho subject to extensive and recent pollution with sewage, was better from a bacterial standpoint than conditions seemed to warrant. In this river there is a slack water basin in which the rate of flow is normally very low, and there is ample opportunity for coagulation and subsidence, in addition to the increased length of time that the bacteria are exposed to the acid in the water.

As previously stated, the acid conditions in the Monongahela River above McKeesport are much less severe than in the Youghiogheny River. At times this water contains free sulphuric acid and sufficient iron and aluminum to thoroly coagulate it, but a considerable part of the time the addition of a coagulant in the form of sulphate of iron or filter alum is required to produce a satisfactory coagulation. It has been found feasible to coagulate this water by the admixture of a small amount of the highly mineralized water from the Youghiogheny River, and plans have been completed for the installation of pumping equipment for this purpose. A small proportion of the Youghiogheny River provides sufficient iron and aluminum sulphates to coagulate a large volume of water from the Monongahela River. By this unique method of treatment, the supply of coagulants will be obtained a large part of the time without cost other than that of pumping a small volume of water from the Youghiogheny River to the purification plant.

Method of Purification

The actual purification of the water-supply at the present time is accomplished as follows: The raw supply is taken from either the Youghiogheny or Monongahela Rivers, as found most advantageous in regard to the quality shown by the analyses to produce the most efficient and economical purification. The chemicals used are principally lime and soda ash, with the occasional use of sulphate of iron or filter alum, when the water is turbid or badly polluted bacterially. After treatment, the water is thoroly mixed with the chemicals and allowed to settle from 12 to 18 hours. The result of the chemical reactions is the formation of precipitates, which largely settle out during this period of quiescence, carrying with them most of the suspended matter and bacteria. The water is then passed thru sand filters, which remove the last traces of turbidity and almost all bacteria. The few bacteria remaining in the purified water are not harmful in character. As an additional safeguard, however, provision is made to treat the filtered water with liquid chlorine at a moment's notice, at any time that the treatment and filtration prove insufficient to make the water absolutely safe.

The purification process is controlled by frequent analyses of the water and chemicals used for treatment. Tests of the raw supply and the water from various stages in the treatment are made every four hours. The chemicals solutions are tested twice daily, and bacteriological examinations of four samples of water are made daily. These analyses show that McKeesport is supplied with a water which meets in all respects the requirements of a first-class supply.

The New Central Fire Alarm Station at Providence

By Gilbert S. Inman
Superintendent of Fire Alarm, Providence, R. I.

WITHIN the last few months the new central fire alarm station for Providence has been completed and fully equipped. The total cost of the building and equipment exceeds $125,000. The new fire-proof fire alarm headquarters is located in an open space between the New York, New Haven and Hartford freight yards and the State House, a position which isolates it from all surrounding buildings and avoids danger from fire. No wood whatever was used in the construction of this building. The cement floors, laid on a steel framework, are topped with battleship linoleum. The doors are steel, as are also the paneling and the window frames. Even the screen door at the entrance to the building is of steel. The boards on which the electrical sets are mounted are of slate mounted in steel frames and stained to look like mahogany, as are also the telephone, switchboard and clock cases.

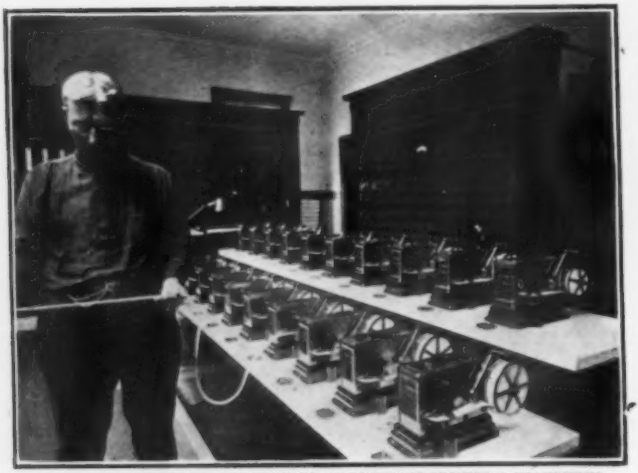
NEW $50,000 FIRE-PROOF FIRE ALARM HEADQUARTERS AT PROVIDENCE, R. I.

When a box is pulled anywhere in the city, the number is indicated by an annunciator on one of the circuits on the four 10-circuit box line operating boards, as well as on the register. This board is equipped with a loud-ringing gong, which operates if there is any trouble on the circuit. There is also a 20-circuit combination tapper and gong board divided between 10 tapper and 10 gong circuits, as well as a 72-circuit protector board for protecting the lines against foreign current. The latter is equipped with bell contacts to call attention to any troubles on the line.

A circuit terminal and distributing board, which will take care of 72 circuits and distribute them to the different boards and instruments, is included in the equipment. Each circuit is equipped with a lightning arrester and 1-ampere glass fuses. This board may also be used for telephone purposes when necessary. Five linemen sets are supplied, and when linemen are out searching for trouble they are able to keep in touch with the central office thru this board.

There are four charging boards which keep the battery for the 72 circuits up to prime efficiency. All the boards are mounted in cabinets and wired with asbestos-covered, slow-burning wire. The tapper and gong circuits are equipped with a multiple key for sending out signals simultaneously over all the circuits. Three transmitting devices are provided so that three special signals can be sent out over all tapper and gong circuits simply by turning a switch.

The tapper and box circuits are equipped with a recording set in the superintendent's office consisting of two punch registers to record the signals which are sent out over the tapper lines and those received on box



BANK OF TWENTY GAMEWELL PUNCH REGISTERS MOUNTED ON ITALIAN MARBLE. EACH REGISTER IS NUMBERED TO PREVENT ERRORS

circuits. These act as a permanent record to prevent dispute on the correctness of the signals which are sent out and received. They are equipped with take-up reels, which keep the records in a convenient form, and with automatic time stamps.

A metallic indicator shows whether any given piece of apparatus is in or out of the engine house. This is manually operated and has a capacity of sixty pieces of apparatus.

The current for the system is supplied by a battery of 1,952 cells. Each battery is mounted on metal racks and housed in a separate room. A manual transmitter is provided for sending out alarms at slow or fast time. The box circuits are timed at one second between blows, the gong circuits are on two-second time, and the tapper circuits on one-second time. Free passage of fire apparatus thru the congested districts of the city is assured by a street-crossing transmitter box. Signals can be transmitted simultaneously to six different sections if desired.

Proportional Representation in Canada and Ireland

By Clarence G. Hoag

Secretary, American Proportional Representation League

THE cities of Vancouver and Victoria, British Columbia, have both voted to adopt the Hare system of proportional representation for the election of their councils. Vancouver, which has a population of about 100,000, is now the largest city on the continent to use the proportional system.

On January 15 the Hare system of proportional representation was used for the first time generally for Irish local elections, no less than 127 Irish municipalities electing their councils or other "authorities" by the Hare system of proportional representation on that day. Before that time only one Irish city, Sligo, had used the new system.

It seems surprising that any election system whatever could give satisfaction to all parties in Ireland at the present time. Yet the Hare system did just that, as is indicated by passages from newspapers representing the Unionist, the Sinn Fein, and the Nationalist parties.

The Hare system of proportional representation is prescribed in the new Home Rule Bill for Ireland, the text of which was made public in England on February 28th. The bill prescribes two parliaments, one for Southern Ireland, the other for Northern Ireland. Section 13 prescribes the election of the members of each of these parliaments by the Hare system of proportional representation. Under the scheme of districting provided, the number of members elected proportionally from each district is from three to eight. After either parliament has been in existence for three years, it is to have power, according to the bill, to change the system if it desires to do so.

Filtered Water Rids City of Typhoid

Number of Typhoid Cases in Trenton, N. J., Reduced from 343 in 1907 to 28 in 1918

By A. S. Fell, M. D.
Health Officer, Trenton, N. J.

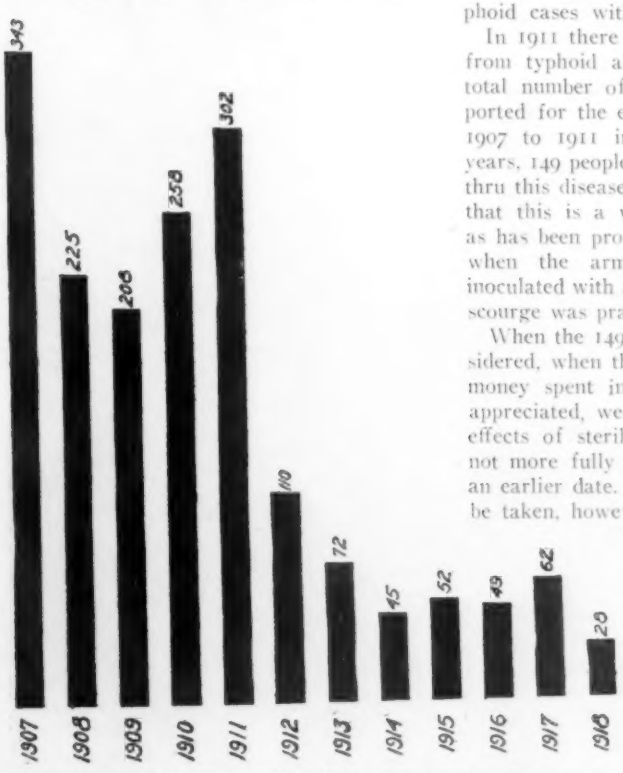
THE unqualified benefits of the filtration and sterilization of public drinking water supplies is admirably shown in the case of Trenton, N. J., which not many years ago had the reputation of being, for its size, one of the worst typhoid-ridden communities in the country. For many years efforts were made to secure a filtration plant for the city, but without result.

In 1911, when commission government began in Trenton, one of the first things accomplished was the construction of a modern filtration plant. Pending the building of this plant, the water was sterilized with hypochlorites. There was, of course, some objection to this on the ground of taste, but these protests soon subsided. Almost immediately upon the installation of sterilizing apparatus, the number of typhoid cases dropped. In 1911 there were 302 cases, while in 1912 after the installation of sterilization the number of cases dropped to 110. Since then the number has decreased almost continuously, and in 1918 but 28 cases were reported during the entire year.

The graphical presentation prepared by the engineering department of the city and reproduced herewith shows at a glance just what sterilization and filtration have done for Trenton in reducing the number of typhoid cases within the city.

In 1911 there were 32 deaths in the city from typhoid alone—four more than the total number of cases of this disease reported for the entire year of 1918. From 1907 to 1911 inclusive, a period of five years, 149 people lost their lives in Trenton thru this disease of filth. It is well known that this is a wholly preventable disease, as has been proved during the recent war, when the armies of the world were inoculated with anti-typhoid serum, and this scourge was practically eliminated.

When the 149 deaths mentioned are considered, when the loss of time, energy and money spent in combating the disease is appreciated, we wonder why the beneficial effects of sterilization and filtration were not more fully appreciated and secured at an earlier date. There is one more step to be taken, however, to completely wipe out typhoid fever from all communities, namely, the voluntary or compulsory immunization of all citizens of susceptible age. In this manner the dread typhoid carrier will be eliminated and the focus of the disease cast out.



NUMBER OF TYPHOID CASES PER YEAR IN TRENTON, N. J.

An Experiment in Tenement House Reform That Has Justified Itself

THE PHIPPS MODEL TENEMENTS, NEW YORK CITY

Representing an investment of $1,000,000, planned to earn 4 per cent, the earnings to be invested in other tenements. The court space is open to the street and used for recreation. There is a playground on the roof

Pavement Construction in Nashville

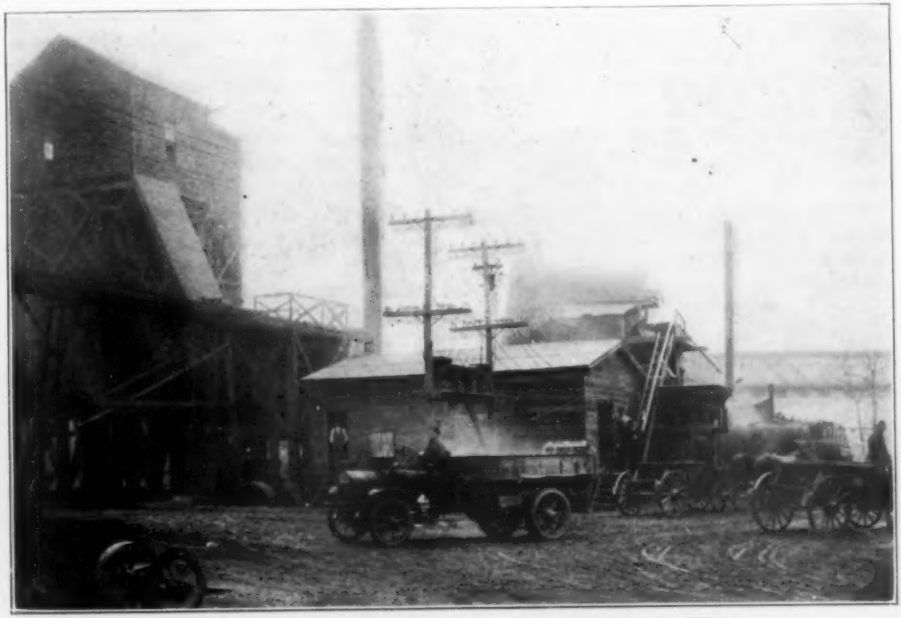
City Forces Lay Bitulithic, Redressed Granite and Creosoted Wood Block Pavements Economically

By William W. Southgate
City Engineer, Nashville, Tenn.

ON account of unsettled labor conditions as an aftermath of the construction of the great U. S. powder plant a short distance from this city, it was late in the season in 1919 before street construction got under way. The Board of Commissioners made appropriations early in the year for street paving work of considerable magnitude. The specifications were prepared, and a letting based thereon was held by the Board about May 15, for 49,000 square yards of bitulithic pavement on macadam foundation, 29,000 square yards of recut and redressed granite blocks, and 3,225 square yards of wood block pavement. The bids exceeded the engineer's estimate and the appropriations on all of the types of pavement except the creosoted wood block, which was let at $4.75 per square yard, including a 6-inch concrete foundation. This forced the Board of Commissioners to undertake with its own forces the construction of the bitulithic pavement and of the recut and redressed granite block pavement. Very considerable amounts of both pavements have been constructed by city forces, and up to the present time we find that the cost thereof is well within the estimates.

Laying Bitulithic Pavement

The city owns its bitulithic mixing and paving plant, and the pavement was laid under patent license fees. This city is favorably situated for the economical construc-



THE MUNICIPAL BITULITHIC PLANT OF NASHVILLE, TENN.

This plant is centrally located at the top of the bank of the Cumberland River adjacent to railroad sidings. The city stone crusher is seen at the left. River gravel and sand come in by boat, are elevated into the storage bins and delivered by gravity to the mixing plant. Fuel oil is used for heating the drums. The whole plant is driven by electric power from the municipal electric light and power plant

tion of bitulithic pavement, on account of peculiar local conditions. The old roadways were constructed of Telford macadam and hence afforded an excellent and perfectly stable base for the foundation. Nashville is located on a limestone geological formation, thus providing an abundance of superior quality limestone which can be quarried and crushed at reasonable prices.

From long experience and observation of the behavior of bituminous pavements laid both over a concrete base and over a well-constructed macadam base, this department has concluded to abandon the use of a concrete base for bitulithic and other types of bituminous pavements. The reason for this conclusion is that bitulithic actually "stays put" on a macadam base very much better than on concrete. The excessively severe pounding of modern heavy automobile trucks seems to exceed the resiliency of the bitulithic wearing surface when founded upon concrete, because concrete is rigid and comparatively inelastic and therefore fails to absorb any of the shock of impact from heavy auto trucks. The consequence is that this severe pounding either crushes down some of the particles of stone in the bitulithic wearing surface or else squeezes out the bituminous cement and causes numerous depressions and a corrugated surface. On the contrary, a properly prepared macadam foundation is quite elastic. It absorbs a considerable portion of the shock of heavy auto trucks and does not throw the entire burden of impact upon the bitulithic wearing surface. Hence its limit of resiliency is not exceeded. This peculiarity has been several times demonstrated by the fact that the same bitulithic mixture when laid upon a macadam base stands up very much better under identical conditions of traffic than when founded upon a concrete base.

Use is made of the old macadam roadway surfaces to the fullest practicable extent for a foundation for the bitulithic. The grades and crowns for the new pavement are adjusted so as to disturb the old macadam roadway bed as little as possible. Frequently the surface is merely scarified, and the depressions of old roadway surfaces are filled in. Then 2 or 3 inches of new macadam is spread and rolled and the bitulithic wearing surface laid. This method of construction results in very considerable economy.

An expert chemist is employed at the plant to make proper analyses of the asphaltic cements and to see that the mineral ingredients are properly graded, and that the bitulithic mixture is of the required quality and consistency before being carted to the roadway. The pavement is laid under the advice and counsel of an expert, furnished by the patentees. It is found that pavements laid under these methods are costing around $2.00 to $2.10 per square yard, including the preparation of the foundation and the patent license fees. The first of the bitulithic was not laid until about the 1st of August, 1919, and hence only about 20,000 square yards were laid.

Redressed Granite Block Pavement

The old granite pavement was founded upon a perfectly stable macadam base. The old blocks were recut on the roadways and temporarily stacked up on the sidewalks for handling. The blocks were cut by expert granite cutters under a contract at a cost of 90 cents per square yard. The method used was to cut the blocks at right angles, crosswise to their lengths, and usually resulted in two smaller blocks for each old block with new heads or paving faces. The blocks were neatly dressed so as to lay with joints not exceeding ½-inch in width. From experience and observation this department concluded that one of the main causes for the unevenness and turtle-backed condition of the surface of the old blocks was the want of uniformity in the thickness of the old sand cushion, and the fact that the sand-bed shifted under the pounding of traffic, particularly so on sharp grades, and resulted in an uneven, disagreeable and noisy pavement under traffic.

To avoid the expense of a new concrete foundation it was decided to utilize the old macadam base and to overcome the trouble from the shifting of the sand-bed by substituting a cinder concrete cushion upon which to bed the recut blocks. This cinder concrete cushion was proportioned and mixed in a dry state, one volume of Portland cement, 2½ volumes of sand, and 5 volumes of steam furnace cinders crushed and passing a 1-inch screen. The cushion was prepared and spread in the dry state immediately in advance of the granite setters as the work progressed. The granite block setters had no trouble whatever in bedding

RELAYING AND WETTING DOWN REDRESSED GRANITE BLOCK PAVEMENT

the blocks on this dry concrete mixture and made no complaint about any trouble in manipulation.

When the blocks were laid, water in sufficient quantities to cause the concrete to properly set was sprinkled over the surface of the granite blocks by a garden hose. The quantity of water necessary was determined by frequently lifting up blocks here and there to inspect the cinder concrete bed. Immediately after sprinkling, the blocks were brought to an even surface by a solid cast-iron hand-roller manipulated by four or five men. Then the mastic filler, composed of approximately equal volumes of hot paving pitch and dry warm sand, was flushed over the granite pavement until all open joints were filled and a slight excess of paving pitch remained on the surface. Dry, suitably-graded pea gravel was then spread over the surplus mastic while still hot, forming a gravel mastic mat coat or carpet over the granite pavement as a top dressing. This afforded a good, gritty foothold for draft animals and produced a quiet pavement.

The contract for setting the blocks was let to expert granite setters at 50 cents per square yard. The city furnished all materials, delivered at the site of the work. This method of bedding granite blocks is probably novel. Each block is rigidly held fast in a concrete matrix like a tooth in a jaw-bone and cannot tip or shift under traffic. The cost of bedding the granite blocks on this cinder concrete cushion was about 40 cents per square yard for the component materials. The cost of spreading and manipulating the dry cinder concrete and applying the mastic filler was included in the contract price for setting the granite blocks.

The total cost of the granite pavement amounted to about $2.75 per square yard under this method of construction. New granite blocks would have cost the city $2.25 per square yard f. o. b. cars, Nashville, hence the economy of recutting and utilizing the old granite blocks.

Creosoted Wood Block Pavement

Bids were taken alternately for plain creosoted wood blocks and for kreolite lug block, with treatment, 14 pounds per cubic foot. The price was identically the same; so on account of the rather severe cross-fall in the roadway and the decidedly better foothold to draft animals afforded by the kreolite lug block, the latter was selected.

The blocks were laid on a 6-inch 1, 3, 6 concrete base, which was very carefully gauged, screeded, and flushed with a creamy mortar, and troweled true to the contour of the pavement, and was then allowed to properly set up and dry out. Immediately in advance of the laying of the block, the concrete base was heavily mop-coated; the blocks were bedded in the hot paving pitch and were then treated with a suitable paving pitch filler. This method resulted in an excellent wearing surface, and it is believed that the trouble from absorption of water by the wood blocks and the consequent buckling and heaving has been overcome.

The Latest English Housing and Town Planning Legislation

By Frank Backus Williams

ENGLAND in her housing and town planning legislation is becoming more and more mandatory and socialistic. In the recent amendments to her "Housing, Town Planning, etc., Act, 1909," "Housing, Town Planning, etc., Act, 1919," and Housing (Additional Powers) Act, 1919," she supersedes the clause in the older law empowering local authorities to do necessary housing and town planning, by clauses compelling them to do so, incidentally enlarging their already considerable powers to that end; and also agrees to pay, with state funds, a portion of any loss they may suffer in so doing; and grants individuals a subsidy on houses built. This is written in no spirit of criticism. The failure of local authorities to undertake essential housing, and the apparent impossibility of obtaining anything like sufficient private funds for the purpose, in this crisis, seem in England to have left no other course open.

The housing provisions in this recent legislation make it the duty of the local authority to prepare within three months a scheme adequate to the local needs for the housing of the "working classes," which has been held to mean, in this connection, those of limited means and for slum clearance schemes when neccessary. These schemes, when approved by the national authorities, the locality must carry out within a reasonable time. If the local authority fails to perform either of these duties, the national authorities are given the power to act in its stead and at its expense. Any loss to be suffered by the locality the nation repays in full less the proceeds of a tax to be levied by the locality, or a penny (two cents) in the pound; or, in the case of housing by the county of its employes, the nation pays 50 per cent of the annual loan charges until April 1, 1927, and 50 per cent thereafter. Powers are conferred upon localities and their previous powers increased to borrow, to acquire, sell, lease and develop land, providing for incidental industries and the amenities, and to lend to individuals, to assist limited-dividend corporations, for low-price housing, and garden city developments, etc.

The Minister of Health is empowered to make grants not to exceed in the aggregate £15,000,000 to persons constructing suitable low-priced houses within twelve months. Building operations which interfere with the provision of new dwellings, and the demolition of existing dwellings, may be forbidden.

Grave as the crisis is, England has not forgotten the lesson taught by the war, that dwellings and their surroundings must be pleasing in appearance. The law requires that schemes for housing shall take into account, and so far as possible preserve, existing erections of architectural, historical or artistic interest, and shall have regard to the natural amenities of the locality. The state may also require for the work the selection of an architect from a panel of the Royal Institute of Architects.

In the provision for compensation for slum areas and buildings condemned, England has adopted the principle, which, startling in its novelty and radicalism as it seems to us, has long been a part of one or two housing laws of continental Europe, that improvements, so called, which are so unsanitary as to be unfit for use, according to existing standards, should not be paid for. The amount to be given the owners of land and buildings condemned in such cases "shall be the value at the time the valuation is made of the land as a site cleared of buildings and available for development in accordance with the requirements of the building by-laws for the time being in force in the district;

"Provided that if in the opinion of the Local Government Board, it is necessary that provision should be made by the scheme for the rehousing of persons of the working classes on the land or part thereof, when cleared, or that the land or a part thereof when cleared should be laid out as an open space, the compensation . . . . shall be reduced" in accordance with certain provisions of the act.

In town planning, as in housing, the recent legislation changes optional provisions into mandatory ones, and local authorities with a population of over 20,000 are now required to prepare planning schemes within three years, submit them to the national authorities, and carry them out, on pain of having the nation act for them at their expense. Readers of this magazine will remember that the French planning law, recently enacted, is similar in this respect. In Canada, with the exception of Nova Scotia, in our own country, and as proposed in Australia, planning legislation is permissive. In Nova Scotia, too, a locality may establish minimum requirements, instead of detailed special plans. Universally, however, in Canada and Australia, as in England, on the continent of Europe, and in civilized countries generally except our own, the resources of the state and nation are to a greater or less extent used to promote housing for people whose means are limited.

"Better Times"

One of the most potent non-political civic influences in New York City has recently been strengthened by the joining together of forty-four settlements. The new organization is known as the United Neighborhood Houses of New York, and has offices at 70 Fifth Avenue.

The work of these houses for civic and community betterment has lately been brought sharply to the attention of the public thru a monthly periodical called *Better Times*, which claims to be the smallest newspaper in the world. As the official spokesman of the United Neighborhood Houses, it promises to be an interesting reflection of new city-wide movements, for in the settlements have originated numerous discussions that resulted in the cleaning up of tenements, the adoption of more stringent health regulations, better lighting and paving of streets in the foreign and congested districts.

Introducing itself in its first issue, *Better Times* states that it will devote itself to social progress. It will keep the outside world informed of the Americanization, city-wide health work and coöperative enterprises in which the neighborhood houses are engaged.

Extra

Better Times

SMALLEST NEWSPAPER IN THE WORLD

PRICE 5c

Vol. 1, No. 2 Published Monthly by the United Neighborhood Houses of New York Feb. 1920

Neighborhood Houses Urged as New York War Memorial; Settlement Work Commended by Prominent Citizens

Appeal for Greater Support

A group of prominent men and women have issued a statement eltdorsing the settlements of New York as "valuable stabilizing forces in these critical times of unrest," and urging the public to give them greater support.

Charles E. Hughes, Henry Morgenthau, George Gordon Battle, Felix Warburg, Thatcher M. Brown, Henry W. Taft, Dr. Katharine B. Davis, Mrs. Henry P. Davison, Franklin Giddings, Herbert Parsons, James Speyer and Arthur Williams are the signers of the endorsement, which reads:

"The settlements of New York have for years been doing a work of Americanization. By planting American homes in the centers of foreign population, by training in self-government classes of young people, by classes in English and Citizenship and in many other ways they have developed ideas of community service. They have interpreted American institutions and upheld American ideals. Neighborhood and community organization has been the aim of the settlments from the first. Present movements along this line received their impulse from the settlements long before these ideas were appreciated for their true worth by the public at large.

"For these reasons we believe the settlements of New York City, strategically situated in neglected neighborhoods and among our foreign neighbors, should be adequately sup-

(Cont. on p. 2)

THE WONDERFUL STORY

Survey of the City Being Made

Neighborhood houses have been suggested as a fitting war memorial for this city by the United Neighborhood Houses of New York. The New York Community Service, at the suggestion of the United Neighborhood Houses is making a survey of the city to determine where the need for more neighborhood houses is greatest. The following letter was recently sent to Mr. Rodman Wanamaker, chairman of the Mayor's Committee on a Permanent Memorial to Soldiers:

"We venture to bring your attention to a vital need, the meeting of which will not only be a fitting memorial to the patriotism and loyalty of those who gave their all for the high ideals of democracy, but

Fundamentals in Municipal Accounting

By Lloyd Morey, C.P.A.
Comptroller and Assistant Professor of Governmental Accounting, University of Illinois

THE general purpose of accounting—that most important adjunct of every enterprise either public or private, where finance is involved—has been stated as being "to produce complete, accurate and prompt information about business transactions and results." Of municipal accounting the purposes may be more particularly analyzed under these heads:

1. *Record:*—the complete, accurate, and permanent recording of public financial transactions
2. *Security:*—the controlling and safeguarding of public funds and properties
3. *Administration:*—the presentation of facts essential to administrative guidance
4. *Responsibility:*—the localizing of the responsibility for every official act
5. *Efficiency:*—a means of checking and comparing the results obtained by the various department heads
6. *Publicity:*—the complete accounting to the public for the stewardship entrusted to the various officials by it

These important functions call for adequate and well-devised systems of accounting and business procedure, certain fundamentals of which are, I believe, paramount and of general application, and worthy of our present consideration.

The Budget

The first step in the establishment of a proper system of business and accounts is the budget, the heart of every good system of public accounts. The Illinois statute requires that cities adopt an annual budget. What a godsend it would be under present conditions if the constitution of the United States made the same requirement of Congress!

A budget to be really effective must be complete, a "balanced statement of revenues and expenditures," a complete financial program for the year. Recent Illinois legislation extended somewhat the liberties as to emergency appropriations during the year. Altho believing that the conditions which led to the enactment of these laws were sufficient to make them necessary, the writer warns against too much development of this idea. The financial program for the fiscal year should be fully expressed in the annual budget, which, making a reasonable allowance for emergency, should be lived within.

Every public budget should, in my opinion, be prepared by or under the direction of the executive, and be submitted by him and with his recommendations to the legislative body, which must properly have final jurisdiction. In the case of municipalities, this would place the responsibility of the preparation of the budget on the mayor, who would obviously depend very considerably in this respect on his chief financial officer.

In the matter of appropriations, there has been much diversity as to method. Appropriations have sometimes been made in great detail, and usually under such circumstances have worked considerable hardship. Other appropriations have been made with woeful absence of detail either in the estimates or in the final form of the appropriation. A reasonable medium between these two extremes, neither of which is conducive to the most economy or the most satisfaction in administration, is to be noted in recent budgets. No appropriation, in my opinion, should be made except on the basis of properly itemized estimates. On the other hand, appropriations should comprehend various activities and allow reasonable leeway in expenditures for the various items. In other words, the best form of appropriation from the standpoint both of the department head and of the administration in general, is a lump sum appropriation based on itemized estimates, and with accounting machinery which provides a check to see that expenditures are made in general accord with the estimates and that funds are not materially diverted from the purposes for which they are appropriated.

Development of Accounts

After the budget has been adopted, the next important step is the development of accounts with revenues and appropriations. Cash accounts, quite often found to be the only accounts maintained, are wholly inade-

quate. "Revenue" comprehends the total amount of funds accruing from general sources during a fiscal period, whether or not these funds have been fully collected. Expenditures, on the other hand, include all costs incurred on account of a given fiscal period. Accounts which will reveal these facts are the only accounts which can be compared as to various periods with accuracy and satisfaction.

Accounts with revenue will consist of estimates set up from the estimates included in the budget, and credits to these estimates as the revenues are realized. Accounts with appropriations must show more than the mere amounts appropriated and the warrants paid on account of them. The Illinois statute limits the authority of department heads or officials to contract beyond the amount appropriated. In order to make certain that this requirement is carried out, there must be a centralized accounting and purchasing control, and accounts with appropriations showing all encumbrances resulting from orders or contracts placed. Appropriation accounts will be adequate and complete only if kept in this way, and the importance of these facts in the general financial statements will be at once evident.

Expenditures Should Be Classified

An additional important feature of the appropriation accounts is the classification of expenditures. A uniform, complete and continuous classification of expenditures is of the utmost importance for purposes of budget making and of general administration. Uniformity must be applied among the departments in the classification of items, and as between successive periods. A comprehensive classification of expenditure involves a three-fold distribution:

(a) By departments
(b) By items
(c) By unit costs as practicable

Departmental classification still varies greatly, in spite of numerous proposals for standardization. A uniform departmental classification in all cities would be of the utmost value. Classification of items should be uniform as far as possible among the various departments. It should not be too extensive and should be capable of further expansion. The Illinois state classification applied to all institutions and departments of the state for the last five years is worthy of notice: salaries and wages, office expense, travel, supplies, repairs, equipment, and contingencies.

In addition to the accounts with revenues and appropriations, it is important that a complete set of capital accounts, or accounts with property and debt, be maintained. Accountants have long recognized, and city officials are coming to understand, the value of showing balanced capital accounts. Detailed records of all kinds of property are essential for purposes of fidelity, ownership, and maintenance. These records will consist of detailed inventories, the totals of which appear in general accounts and in the capital balance sheets. Proper accounts with assessments, sinking funds, etc., belong to this group.

There is an increasing tendency in this country for municipalities to take over public utilities. Whenever this is done, it is of the utmost importance that an adequate and comprehensive accounting system be applied to these utilities from the outset. Public operation of utilities may or may not be a good thing. It is essential that wherever it is undertaken, a complete system of accounts be maintained, in order that all facts connected with the operation of the utility from its beginning may be at all times fully available.

Regular Financial Reports

In addition to the importance of adequate municipal accounts, some fundamentals of which have been suggested above, I wish to stress the importance of regular and comprehensive financial reports. Governmental reports fall generally into two classes:

(a) Administrative reports for the use of officials
(b) Public reports for the information of the general public

Administrative reports should be frequent, at least monthly, and should be detailed as to budget, funds, properties, etc. Public reports should be prepared at least annually and should contain: (1) a readable summary which will acquaint the average citizen with the facts; (2) the necessary financial statements. These statements should include:

(a) A complete balance sheet or statement of assets and liabilities, including current and capital assets, liabilities, authorizations and reserves
(b) Statements of revenue and expenditure, revenue being classified by

sources, and expenditure by departments and under such other general analysis as is practical. A chronological list of warrants issued is an exceedingly inadequate statement of expenditures

(c) Statements showing comparison with other years

(d) Detailed statements of property, indebtedness, and sinking funds

In this connection, attention should be called to the value and importance, not only in respect to published reports, but in respect to accounting in general, of regular audits by certified public accountants. Such audits should be a part of the procedure of every municipality, as well as every governmental unit.

To summarize, the following are suggested as the essentials of an adequate municipal accounting system:

1. A complete budget
2. Accounts with revenues and appropriations
3. Capital and fund accounts
4. Balance sheet reports

These are not new ideas, but they are fundamental and not yet commonly carried out. We should apply the same principles to public business as to private affairs. City officials can be of genuine service to both the present and the future public by establishing good business and accounting records and procedure. In these troubled times, not the least among the factors contributing to the high cost of living and its attendant unrest is the high governmental expense with consequent high taxes. The public is naturally and properly more and more critical of expenditures for purposes of Government. Nothing will do more to aid in reducing these expenditures if they are excessive, or in substantiating and justifying them if reasonable, than a sound and comprehensive system of public accounts.

Acknowledgment.—From an address delivered before the Illinois Municipal League, at Springfield, Ill., January 30, 1923.

Will You Help in the Special-Library Census?

AT a time when the Government is counting up its inhabitants, the Special Libraries Association is enumerating the special library collections of the country, because there does not exist at present an adequate directory of special libraries.

Business men realize what it means not to have a directory of manufacturers at a time when they wish to purchase a particular machine—and have no other way to go about it. The city librarian is in just such a position when he or she is investigating a particular subject. Would it not be simpler if he or she knew of another library that had specialized on subjects of that type, and which had probably gone over the same ground?

In the spirit of coöperation, and in order to list the special information sources of the country, the Special Libraries Association—the national body of special librarians—submits the following questions and respectfully asks you to take the trouble to answer them. When compiled, the directory will not be used as a mailing list for advertisers, but merely for the purpose stated, viz., to have in a central place a record for the special information sources of the country.

A "special library" has been defined as:

"A good working collection of information upon a specific subject or field of activity; it may consist of general or even limited material serving the interests of a special clientele; and preferably in charge of a specialist trained in the use and application of the particular material."

If your library comes within the above qualifications the S. L. A., will appreciate the following information from you:

1. Name of institution or company
2. Name by which library is known
3. Name of librarian or custodian
4. Can it be classified as any of the following: financial; business; legal; engineering or technical; institutional; municipal; reference; agricultural?
5. If not, how can it be classified?
6. Does it serve a special clientele?
7. Would your librarian be willing to assist other special libraries to a reasonable extent?

The above data should be sent to Wm. F. Jacob, Chairman, Library Census Committee, care General Electric Company, Schenectady, N. Y., who will be glad to answer any questions relating thereto.

Forward Steps
Reported to THE AMERICAN CITY by Municipal Officials & Department Heads

Finance Departments

Converting a "Tax Sale" from a Liability Into an Asset

SOUTH VANCOUVER, B. C.—The method adopted in the municipality of South Vancouver for advertising a recent "tax sale" may be of interest to other cities which face the task of collecting overdue taxes.

A tax sale may not appear, to some, a good advertisement for a municipality, but, as Commissioner, I conceived it to be in the best interests of the public to let them know just what we had in South Vancouver, and I was able to give statistics which would go far to correct the impression which a tax sale might create.

We put into the advertisement the total number of public and high schools, the value of these and of other buildings, the total number of pupils in our schools and the number of teachers, the number of street lights and water services, the miles of paved streets, macadamized streets and other streets, the street railway, water-main and sewer mileage, etc. We also stated what the Dominion Government was doing towards the dredging of the north arm of the Fraser River, which for over four miles traverses our southern boundary. The number of our industries was pointed out, and attention was drawn to the fact that we had a good many desirable sites for other industries besides those already established. We explained the geographical position of the municipality, pointing out that a stranger coming out of the city of Vancouver into South Vancouver would not know that he had crossed the boundary line unless some one told him. The city of Vancouver has a population of about 115,000, while that of the municipality of South Vancouver is 30,000.

This information given by means of advertisement and the comment which the advertisement evoked came as a surprise to many of the South Vancouver people themselves, who had not grasped the extent to which the amenities of civilized life had been provided, nor our opportunities for development and expansion. This advertisement, clear and comparatively brief, not only drew the attention of the general public to the facts in connection with the municipality, but was an inducement for non-residents who own South Vancouver property but had not kept in close personal touch with the place to pay up arrears of taxes.

The advertisement ran for a week, and it was followed by a smaller-space advertisement giving supplementary facts, until the day before the sale began. Experience has taught us that with advertising reiteration is as effective as it sometimes is in rhetoric.

We have every reason to be satisfied with the results. Thus far we have obtained in arrears of taxes, as a result of the sale and otherwise, over $410,000, and we actually sold 1,000 parcels.

When I came here as Commissioner, appointed by the British Columbia Government, the floating indebtedness of the municipality was, in round figures, half a million. I consolidated this indebtedness in the bank and paid off all the small creditors. Prior to this time arrears of taxes were piling up at 50 per cent per annum. For example, in 1917 the levy was scarcely half met when the year expired; during the eight months of 1918 when I held office the receipts were but 55 per cent of the levy. During 1919 80 per cent of the current taxes was received. The previous tax sale held in this municipality—in 1915—(there was no other until last fall) was advertised in the usual cold, unattractive way, without any special features, with the result that only about $40,000 worth of property was sold to the public.

South Vancouver deserves good advertising. It is beautifully situated, the northern part sloping towards Burrard Inlet, and the southern part towards the north arm of the Fraser. It contains 14½ square miles, and every bit of it is suitable for suburban homes. It houses a great many of the industrial workers of the city of Vancouver. We therefore had fine material from which to compile an attractive advertisement. The press was not slow to grasp the fact, and with general editorial comment enlarged the bounds of our advertising contract. It gives me pleasure to testify to the value of a public-spirited press in initiating and supporting any movement for spreading knowledge useful and stimulating to municipal progress.

F. J. GILLESPIE,
Commissioner.

Park Departments

How One Progressive City Makes Use of Its Park Facilities

BLOOMINGTON, ILL.—On the south side of the city of Bloomington lies Miller Park, one of the city's beauty spots and its chief recreational center. The park is equipped with a zoo of the best type, a pavilion which has been declared to be one of the best in the country, a band-stand, playgrounds for the children, picnic grounds with an ample supply of tables and benches which are freely used by both the children and the grown-ups, boating facilities and bath houses. All these are arranged conveniently and attractively, and the entire park is beautified with shrubbery, plants and flowers, and in summer especially presents a most pleasing picture.

At the end of the Miller Park car line one is greeted with an attractive entrance and a flight of stone steps leading to the main walk. The visitor is impressed at once with the beauty of the place, its large outspreading trees, its well-kept lawns and artistically arranged flower beds and shrubbery. A short distance from the main entrance is an imposing monument erected to McLean County's war heroes. Further south and on the same side of this central walk is the band-stand, surrounded by comfortable benches capable of accommodating hundreds of people. During the summer months band concerts are an added attraction to the park, and the band-stand furnishes a suitable platform for speakers who appear on programs at picnics and other gatherings. Near-by is the large picnic ground, a most popular place where picnic suppers are held by families, neighbors and larger gatherings.

At the end of the central walk, and on the north shore of the lake, stands the pavilion. Nature seems to have provided this location especially for such a structure. The land in front of the building

THE PAVILION IN MILLER PARK, BLOOMINGTON, ILL.

BATHING BEACH AND BATH HOUSES IN MILLER PARK

slopes gently down to the water's edge. A wide veranda extends around the entire building. On the south side, overlooking the lake, this veranda widens out and assumes the proportions of a large balcony. Here one gets a wonderful view of the lake and the south side of the park. Just off this balcony is the refreshment room, and in the west end of it is a small museum in which are many mounted specimens of birds and animals.

A small balcony, large enough to accommodate an orchestra comfortably, is built above the refreshment room, and on the floor above is a large dance hall with cloak- and dressing-rooms built at the north end. In the basement, the floor of which is on a level with the ground at the south side of the pavilion, are the lavatories.

To those interested in aquatic sports one of the most interesting features is the bathing beach with its equipment of appropriate apparatus. Two large bath houses have been constructed on the west shore of the lake, with diving platforms, springboards and ladders. The beach extends around a portion of the north shore, and here a place has been fenced off, so that the little tots, too small to venture in any but shallow water, may wade. In winter the lake furnishes an admirable place for skating, and thousands have made good use of the ice for this winter sport. As a precaution against accident, skaters are not allowed on the ice until it reaches a thickness of six inches.

Only a short distance north of the bath houses is the large zoo, or animal house, a place which is visited both winter and summer by large numbers of people. The building was erected only a few years ago. It is made of brick and stone, with the cages on the south side arranged so that in mild weather the doors can be raised and animals permitted to sun themselves. Here are housed African and Mexican lions, leopards, tapir, llama, porcupine, ostrich, monkeys and birds of many varieties. Other attractions at the zoo are many varieties of bear, two species of deer, buffalo, elk, angora goats, etc.

At the south of the lake are about twenty acres of original forest, with drives built thru it. This opens on a highway along which is a blazed trail, and the coming season the park officials plan to build an archway with the word "Welcome" at the entrance, and to construct ovens so that automobile tourists may find a haven of rest where they may prepare their meals and camp for the night.

Like other public parks, Miller Park has a certain amount of revenue from its various concessions and attractions. This accrues from boating, bathing, fishing, dancing, an electric piano, refreshment concessions and miscellaneous sales, which include the disposal of various salvaged articles. This matter of revenue furnishes another concrete evidence of the growing popularity of the park. The receipts for the year 1919 nearly doubled those of the previous year; the receipts for 1918 amounted to $4,902.46, and those of the past year totaled $7,991.30. These were divided as follows; boating, $3,066.75; bath-

ing, $3,494.11; fishing, $324.60; dancing, $480; piano, $203.50; refreshment concession, $1,250; miscellaneous sales, $172.34.

One method of cutting down the expense of the park maintenance has been the cultivation of an extensive garden by the custodian. This supplies vegetables and other green stuff for that part of the zoo which requires it, and eliminates the expense that would otherwise be incurred in the purchase of this food on the market.

JOHN G. WELCH,
Commissioner of Public Property.

City Managers

Warning Citizens of Ordinance Violations by Cards

OTSEGO, MICH.—The sending out of printed forms covering in the briefest possible manner notices of violations of city ordinances has proved most effective in Otsego in securing abatement of the conditions complained of. We use three different colors for the cards, the notice of the fire hazard being red, the notice of a violation of a health ordinance being white, and that referring to the violation of the motor vehicle ordinance lavender. These warnings operate most effectively. At first the recipients were inclined to be haughty because they were unaccustomed to the standard of safety and cleanliness that the present city administration is enforcing, and occasionally a prosecution is necessary before the offender respects the law. In most cases, however, the warnings are sufficient.

GERARD ALAN ABBOTT,
City Manager.

Name	Name .....
Address	Address .....
Date	Date.....
Nature of objection	A FIRE HAZARD
	exists in connection with.....
	.....
	and deserves your immediate attention.
	.....
	Officer

Name	Name .....
Date	The Premises at.....St.
Unsanitary condition	Are Not Sanitary.....
.....	To Safeguard the Health of Otsego.....
at	You are notified this.....day of.....
Cause	To .....
	.....
	.....
	Officer

ABOVE: Notice of Fire Hazard

AT LEFT: Notice of violation of health ordinance

BELOW: Notice of violation of motor vehicle ordinance

Name	License.....
Make of Car.....	Name .....
.....	You are cautioned against further violation of the
License.....	City Ordinance with reference to.....
Date	.....
Nature of complaint	Date.....
	.....
	Officer

City Clerks

Manitowoc's Municipal Program

MANITOWOC, WIS.—The exceptional growth of the city of Manitowoc has necessitated the development of an elaborate municipal program, which includes the build-

ing of bridges, additional paving, the improvement of several miles of streets, the extending of the city's sewer and water system, the introduction of modern methods of disposal of garbage, the erection of new ward and high schools, the enlargement and beautification of park and playground areas, the complete motorization of the Fire Department, and a new City Hall.

It is estimated that these improvements will cost $2,500,000, and will take a period of three years. The motorization of the Fire Department has already been accomplished. The city now has two fire stations and maintains a department of twenty men. The motor apparatus includes a combination hose and chemical, a hook and ladder truck, a 500-gallon pumper, and a chief's car.

The extension of the sewer and water system is now under way. Two and one-half miles of new water-mains and three miles of new sewer pipe were laid during the season of 1919, and a like amount of work arranged for the season of 1920, thus bringing a large portion of the city into a more sanitary and healthful condition. Two new bridges, one draw, and one bascule lift, are being built over the Manitowoc River.

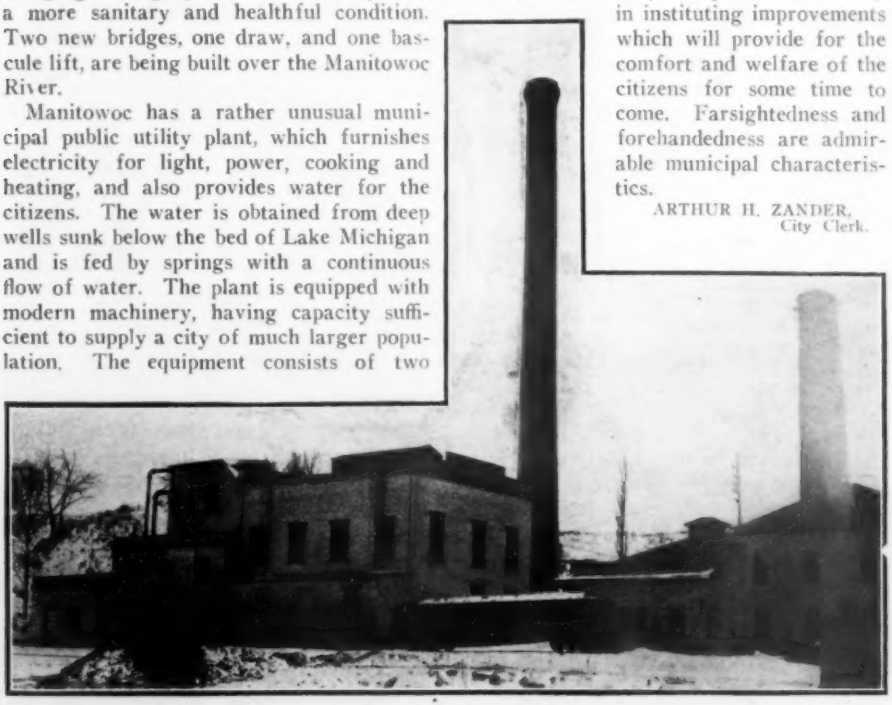
Manitowoc has a rather unusual municipal public utility plant, which furnishes electricity for light, power, cooking and heating, and also provides water for the citizens. The water is obtained from deep wells sunk below the bed of Lake Michigan and is fed by springs with a continuous flow of water. The plant is equipped with modern machinery, having capacity sufficient to supply a city of much larger population. The equipment consists of two 1,500,000- and one 3,000,000-gallon pumps; one 1,500 k. w., one 750-k. w. and one 300-k. w. turbine generators. A rate of lighting maximum 8 cents to 3 cents minimum per k. w. h., and power maximum 5 cents to 1½ cents minimum, is charged for electricity. The city is one hundred per cent metered as to water services. The water is of fine quality; its purity is insured by annual chemical tests.

The public utilities plant is under the management of a Utilities Commission composed of five representative citizens who serve without pay. The term of service is three years.

The growth of population which has made necessary the increase in public facilities shows some interesting figures. The population in 1910, according to the U. S. census, was 13,037. In 1917 it had increased to 15,574, and by July 1, 1918, to 18,067, a total increase of 5,910. The gain since July 1, 1918, is estimated to be 4,000, bringing the total at the present time up to 22,000, estimated.

It is evident that the city has done wisely in instituting improvements which will provide for the comfort and welfare of the citizens for some time to come. Farsightedness and forehandedness are admirable municipal characteristics.

ARTHUR H. ZANDER,
City Clerk.



THE PUBLIC UTILITY PLANT IN MANITOWOC, WIS.

Departments of Education

A Municipal Loose-Leaf Social Service Directory

PHILADELPHIA, PA.—At the request of many social agencies and social workers a "Social Service Directory of Philadelphia" has been prepared for the use of those connected with social service work of organizations, institutions, churches, and city, state and governmental departments, and for the citizens of Philadelphia in general. The work was done by the writer of this item under the direction of the President Judge, Charles L. Brown, of the Municipal Court of Philadelphia.

The Directory is issued in loose-leaf form so that corrections and changes can be made from time to time and new organizations added. There are nearly 1,200 name references in the alphabetical name list, and more than 2,000 classified activities of social service organizations are collated in the subject index. These organizations include those dealing with families, relief, children, hospitals and other institutions, and also church social service, civic, religious and war service groups.

For every organization the following information is given: name, address, head worker, telephone number. Information covering organizations doing similar work is made uniform; for example, in the case of settlements all the separate settlement activities are listed and those which are common to all settlements are classified. Nothing is included which could be construed as propaganda for any particular institution or which would tell what the institution intended to do unless the plans were well under way. Only skeleton outlines of present activities are given, so that no institution is favored above another.

The matter of endorsement of any organization is left to the Chamber of Commerce. Therefore, the Directory includes, under "Philadelphia Chamber of Commerce," a detailed statement of the policies of the Charities and Welfare Bureau of that organization, which is the endorsing body in Philadelphia. All out-of-town organizations which give service to the people of Philadelphia are listed.

The loose-leaf form is expected to be of great assistance in facilitating revision of the Directory. Our plan is to revise it in two ways: by sending minor corrections in typewritten form to the subscriber from time to time; and by reprinting the book page by page as that becomes necessary.

LEON STERN,
Supervisor, Educational Department, The Municipal Court of Philadelphia.

Water Company Appreciates Responsibility to the Public

AS a means of keeping before the citizens of Terre Haute, Ind., the fact that it appreciates its obligation to provide an adequate supply of pure water for the consumers, the Terre Haute Water Works Company has made use of the advertising columns of its local newspaper, as shown on page 375.

On March 20, the company sent out to prominent citizens—officials, physicians, educators, and others—a circular letter with a blue print of curves showing that as the number of city water consumers in Terre Haute increases, the typhoid death rate decreases. The letter reads in part as follows:

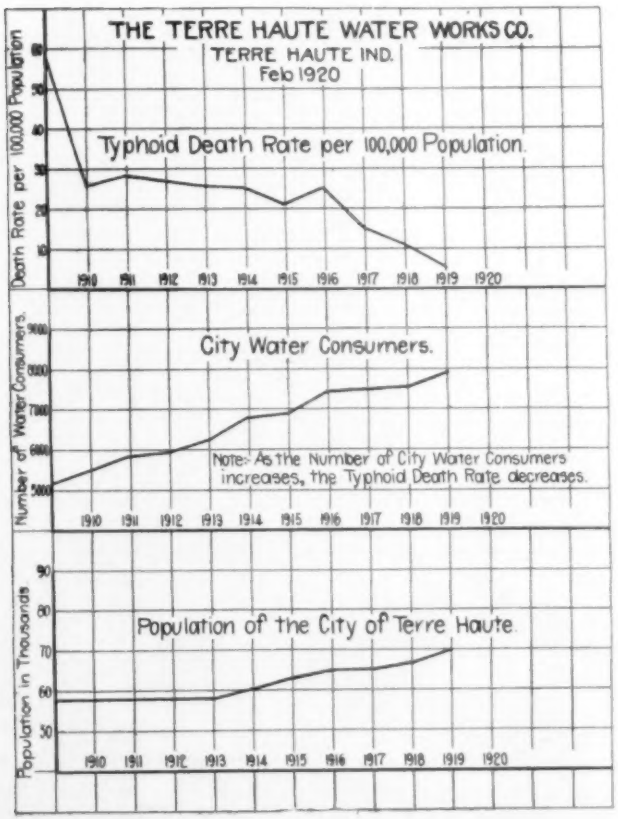
One of the most valuable assets that a community can offer to its citizens, or prospective citizens, is the assurance that the public water supply is being well guarded and maintained at a high degree of purity. Possibly no better proof can be offered of this fact than a low death rate from typhoid fever, and it is for the purpose of conveying this information that the enclosed blue print is sent to you.

As the number of city water consumers increases, the deaths from typhoid have decreased. During the ten years from 1909 to 1919, the number of city water consumers increased from 5,200 to 7,900, while the death rate from typhoid fever per 100,000 population decreased from 58.5 in 1909, to 5 in 1919. This is probably the most positive proof that can be offered as to the high sanitary condition of the city water supply.

The U. S. Public Health Service has fixed certain standards of purity for water furnished on common carriers. This specifies

A REPORT TO THE GOOD PEOPLE OF THE GOOD CITY OF TERRE HAUTE

ADVERTISEMENT IN A LOCAL NEWSPAPER, SIGNED BY THE TERRE HAUTE WATER WORKS COMPANY


THE TERRE HAUTE WATER WORKS CO.
TERRE HAUTE IND.
Feb 1920
Typhoid Death Rate per 100,000 Population.
Death Rate per 100,000 Population
1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920
City Water Consumers.
Number of Water Consumers
Note: As the Number of City Water Consumers increases, the Typhoid Death Rate decreases.
1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920
Population of the City of Terre Haute.
Population in Thousands
1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920

that, on an average, not more than 20 per cent of the samples tested shall show the presence of certain specific organisms. Five of such determinations are made daily of the filtered water at our plant, and this particular organism has been present in less than 3 per cent of the 390 samples tested since January 1, 1920.

It will be observed that the purity of our water-supply is far in excess of that prescribed by the U. S. Public Health Service. There are, however, certain physical properties in the water that have no bearing on the purity of the supply, which cannot be changed. Among these might be mentioned color and taste. The color is caused by the surface water taking up the coloring matter from the falling leaves. The taste may be due to exclusion of air from the water while the river is frozen over, a vegetable growth, or, as it is at this season, to the snow and ice which has remained on the ground during the winter, taking up or absorbing a taste from the soil.

City Manager Municipalities

THERE is presented herewith a complete list of all towns and cities reported to The City Managers' Association as operating under, or pledged to, some variety of city manager government. The total number on April 1, 1920, is 178, with 5 additional towns across the Canadian border. Of the 178, 112 have adopted approved charters, or charter amendments, indicated by "C" under the column headed "Plan"; 9 have modified manager plans by charter marked "C—," while 57 have created the position of manager by ordinance of the local governing body only, indicated by "o." The column marked "Number" indicates the number of men who have successively held the position of manager. That headed "Cities," following the manager's name, indicates the number of cities each man has served as manager. To date, there have been 30 "promotions" of managers from one city to a larger.

The population figures are estimates. Added information and corrections to the data submitted will be welcomed by The City Managers' Association, Harrison G. Otis, Secretary, 1812 Tribune Building, New York.

State and City	Population	Plan	In Effect	Number	Manager	Cities	Appointed	Salary
Arizona								
Phoenix	40,000	C	April, 1914	3	V. Avery Thompson	1	Jan., 1918	$5,000
Arkansas								
Bentonville	3,000	o	Sept., 1915	1	Edgar Masoner	1	Sept., 1915	1,500
Hot Springs	18,000	C	April, 1917	2	Geo. R. Belding	1	Sept., 1918	2,100
Monticello	3,500	o	Jan., 1918	2	A. M. Bell	1	Jan., 1920	1,800
California								
Alameda	32,000	C	May, 1917	1	Chas. E. Hewes	2	May, 1917	5,000
Alhambra	10,000	C—	July, 1915	3	Grant M. Lorraine	1	Sept., 1919	2,700
Anaheim	3,500	o	Oct., 1919	1	O. E. Steward	1	Nov., 1919	....
Bakersfield	20,000	C	April, 1915	2	F. S. Benson	1	May, 1917	4,000
Coronado	2,500	o	Jan., 1920	1	G. F. Hyatt	1	Jan., 1920	2,100
Glendale	11,500	o	May, 1914	1	T. W. Watson	1	May, 1914	2,400
Paso Robles	2,000	o	April, 1919	1	William Ryan	1	April, 1919	2,000
Pittsburg	7,000	o	Sept., 1919	2	Randall M. Dorton	1	Nov., 1919	3,000
Redding	5,000	o	Oct., 1918	1	E. A. Rolison	1	Oct., 1918	2,400
Salinas	4,000	C	1920					
San Anselmo	2,500	o	Nov., 1917	1	C. A. Macomber	1	Nov., 1917	1,800
San Diego	95,000	o	May, 1915	2	Wilbur H. Judy	1	May, 1919	4,000
San José	40,000	C	July, 1916	2	W. C. Bailey	1	July, 1918	6,000
Santa Barbara	20,000	C	Jan., 1918	3	Fred L. Johnston	1	Mar., 1920	4,000
South Pasadena	5,600	o	Mar., 1920	1	R. V. Orbison	1	Mar., 1920	
Colorado								
Boulder	14,000	C	Jan., 1918	2	W. D. Salter	1	June, 1919	4,000
Durango	5,300	C	Mar., 1915	2	W. H. Wigglesworth	1	April, 1919	1,800
Montrose	4,000	C	Feb., 1914	4	R. P. Hilleary	1	Aug., 1919	3,000
Connecticut								
West Hartford	5,620	o	July, 1919	1	B. I. Miller	1	July, 1919	4,000
Florida								
Largo	500	o	June, 1913	3	W. H. Turner	1	1919	1,200
Ocala	6,000	C	Feb., 1918	3	R. M. Martin	1	Oct., 1918	2,400
St. Augustine	6,192	C	July, 1915	2	Eugene Masters	1	April, 1918	3,600
Sanford	7,000	C	Dec., 1919	1	Gerard A. Abbott	4	Dec., 1919	3,600
Tallahassee	6,500	C	Feb., 1920	1	J. W. Greer	2	Feb., 1920	4,200
West Palm Beach	10,000	C	Nov., 1919	1	Joseph Firth	1	Nov., 1919	5,000
Georgia								
Cartersville	6,000	C—	Aug., 1917	1	Abram Cook	1	Jan., 1918	2,400
Griffin	10,300	C	Dec., 1918	1	E. P. Bridges	1	Dec., 1918	2,550
Rome	14,000	C	April, 1919	1	Sam S. King	1	April, 1919	3,000
Illinois								
Glencoe	3,295	o	Jan., 1914	1	H. H. Sherer	1	Jan., 1914	5,000
Wilmette	7,824	o	Oct., 1918	2	Chas. C. Schultz	1	Dec., 1918	2,100
Winnetka	5,115	o	Jan., 1915	2	H. L. Woolhiser	1	May, 1917	3,600
Iowa								
Anamosa	3,000	o	May, 1919	1	W. F. Hathaway	1	May, 1919	1,800
Clarinda	4,511	o	April, 1913	2	Henry Traxler	1	May, 1919	2,700
Dubuque	47,500	C	April, 1920					
Estherville	4,200	o	May, 1919	1	F. G. Connelly	1	May, 1919	
Iowa Falls	4,000	o	May, 1914	2	J. O. Gregg	1	May, 1917	1,800
Manchester	3,300	o	May, 1916	2	Thomas Wilson	1	May, 1917	1,440
Mt. Pleasant	4,170	o	April, 1916	1	T. W. McMillan	1	April, 1916	1,800
Villisca	2,200	o	May, 1919	1	W. J. Oviatt	1	May, 1919	1,200
Webster City	6,000	C	Oct., 1916	2	G. J. Long	1	April, 1917	1,800

STATE AND CITY	Population	Plan	In Effect	Number	Manager	Cities	Appointed	Salary
Kansas								
Eldorado	10,995	C	July, 1917	1	Bert C. Wells	1	July, 1917	$3,600
Hays	3,300	C	May, 1919	1	Jas. C. Manning	1	May, 1919	3,000
McCracken	1,000	C	May, 1919	1	Leonard L. Ryan	1	May, 1919	1,800
Wichita	75,000	C	April, 1917	2	L. W. Clapp	1	Oct., 1919	6,000
Kentucky								
Cynthiana	5,000	o	Dec., 1915	2	J. J. Curle	1	Dec., 1918	
Maine								
Auburn	17,000	C	Jan., 1918	2	Edward A. Beck	3	Feb., 1919	5,400
Massachusetts								
Concord	7,000	o	April, 1920					
Norwood	14,000	C—	Jan., 1915	2	Wm. P. Hammersley	1	Mar., 1918	4,000
Waltham	33,000	C	Jan., 1918	2	Henry F. Beal	1	Feb., 1920	5,000
Michigan								
Albion	9,000	C	Jan., 1916	3	W. E. Baumgardner	1	May, 1918	2,000
Alma	7,542	C	May, 1919	1	W. E. Reynolds	1	May, 1919	4,500
Alpena	13,300	C	April, 1916	2	Chas. T. Park	1	April, 1918	1,920
Big Rapids	5,100	C	April, 1914	4	Dan H. Vincent	1	May, 1917	1,200
Birmingham	5,000	C	April, 1918	2	Maurice Lowman	1	Mar., 1919	2,750
Cadillac	9,734	C	Mar., 1914	3	George Johnston	1	Jan., 1918	2,200
Crystal Falls	7,000	C	April, 1918	1	J. H. Sanders	1	April, 1918	3,000
Eaton Rapids	3,000	o	Oct., 1913	4	P. T. Mitchell	1	Mar., 1920	
Grand Haven	7,500	C	April, 1915	2				
Grand Rapids	165,000	C	Mar., 1917	2	Fred H. Locke	1	May, 1918	5,000
Grosse Pte. Shrs.	1,200	C	June, 1916	2	H. N. Kennedy	1	April, 1918	4,200
Jackson	52,000	C	Jan., 1915	3	A. W. D. Hall	1	May, 1917	4,000
Kalamazoo	55,000	C	June, 1918	1	Harry H. Freeman	1	June, 1918	6,000
Lapeer	4,500	C	May, 1919	1				
Manistee	9,690	C	May, 1914	2	P. H. Beauvais	1	May, 1918	4,000
Muskegon	50,000	C	Jan., 1920	1	I. R. Ellison	3	Jan., 1920	
Otsego	4,000	C	May, 1918	2				
Petoskey	6,000	C	April, 1916	4	J. Frank Quinn	1	Jan., 1920	5,000
Portland	2,000	C	Jan., 1919	1	F. L. Jenkins	1	Jan., 1919	1,800
Royal Oak	6,000	C	May, 1918	2	Geo. E. Weitzel	1	Oct., 1918	3,000
St. Johns	4,000	C—	Aug., 1918	2	Theo. H. Townsend	1	July, 1919	3,000
Sault Ste. Marie	14,000	C	Dec., 1917	2	Wilder M. Rich	1	Aug., 1918	3,000
Three Rivers	5,750	C	April, 1918	1	O. O. Johnson	1	April, 1918	1,800
Minnesota								
Anoka	4,300	C—	April, 1914	1	Henry Lee	1	April, 1914	1,200
Morris	3,500	C—	Jan., 1914	2	Frank I. Haight	1	Oct., 1918	1,800
Pipestone	3,500	o	May, 1917	1	F. E. Cogswell	1	May, 1917	1,800
Montana								
Columbus	1,000	o	Nov., 1918	3	Harry P. Schug	1	Jan., 1920	1,800
Glasgow	3,500	o	July, 1916	2	Harvey Booth	1	Mar., 1918	2,100
Scobey	1,000	o	Jan., 1920	1	Roy N. Stewart	1	Jan., 1920	
Nebraska								
Alliance	7,000	o	Aug., 1919	1	Cassius C. Smith	2	Aug., 1919	3,000
Chadron	3,140	o	April, 1920	1	J. H. Rayburn	1	April, 1920	5,000
New Mexico								
Albuquerque	20,000	C	Jan., 1918	3	James N. Gladding	1	Feb., 1920	5,000
Clovis	7,000	o	June, 1919	1	Oscar Dobbs	1	June, 1919	2,700
Roswell	9,000	o	May, 1914	3	Clyde Fulton	1	Mar., 1920	
New York								
Auburn	40,000	C	Jan., 1920	1	John P. Jaeckel	1	Jan., 1920	4,000
Newburgh	30,000	C	Jan., 1916	4	W. Johnston McKay	1	Sept., 1920	3,600
Niagara Falls	55,000	C	Jan., 1916	2	Edwin J. Fort	1	Sept., 1918	5,000
Sherrill	1,500	C	June, 1916	3	Amos G. Reeve	1	Feb., 1920	
Watertown	40,000	C	Jan., 1920	1	C. A. Bingham	3	Jan., 1920	7,500
Watervliet	16,073	o	Jan., 1920	1	Jas. B. McLeese	1	Jan., 1920	4,500
North Carolina								
Elizabeth City	8,925	C	April, 1915	3				
Gastonia	20,000	C	Aug., 1919	1	W. J. Alexander	1	Aug., 1919	3,600
Goldsboro	11,000	C	July, 1917	2	I. M. Cashell	1	Oct., 1918	3,300
Hickory	5,200	C	May, 1913	4	R. G. Henry	1	Feb., 1920	3,000
High Point	14,000	C	May, 1915	3	R. L. Pickett	1	Mar., 1916	2,700
Morehead City	3,500	o	June, 1916	2	John S. Bennett	1	June, 1919	2,100
Morganton	4,250	C	May, 1913	3	W. R. Patton	1	May, 1918	2,100
Tarboro	4,568	o	April, 1915	1	J. H. Jacocks	1	April, 1915	1,500
Thomasville	5,000	C	May, 1915	6	Jas. T. Stewart, Jr.	1	Sept., 1919	2,500
Ohio								
Akron	200,000	C	Jan., 1920	1	W. J. Laub	1	Jan., 1920	10,000
Ashtabula	23,000	C	Jan., 1916	2	M. H. Turner	1	Jan., 1918	3,000
Dayton	153,830	C	Jan., 1914	2	James E. Barlow	1	Mar., 1918	7,500
East Cleveland	25,000	C	Jan., 1918	1	C. M. Osborn	1	Jan., 1918	6,000
Gallipolis	6,490	C	Jan., 1918	1	Edward E. Myers	1	Jan., 1918	1,500
Painesville	6,750	C	Nov., 1919	1	Thomas B. Wyman	1	Jan., 1920	4,000
Sandusky	25,000	C	Jan., 1916	3	Geo. M. Zimmerman	3	April, 1918	5,000
So. Charleston	1,500	C	Jan., 1918	1	P. H. Cheney	1	Jan., 1918	1,600
Springfield	70,000	C	Jan., 1914	2	Ossian E. Carr	3	Sept., 1918	6,000
Westerville	3,500	C	Jan., 1916	2	Ralph W. Orebaugh	1	Sept., 1917	2,100
Xenia	10,000	C	Jan., 1918	1	Kenyon Riddle	2	Jan., 1918	3,600

State and City	Population	Plan	In Effect	Number	Manager	Cities	Appointed	Salary
Oklahoma								
Coalgate	4,000	C	July, 1914	3	Leslie E. Bay	1	Aug., 1919	$1,620
Collinsville	2,500	C	Feb., 1914	2	F. A. Wright	1	May, 1916	1,800
Madill	2,000	C	Nov., 1917	3	A. P. Marsh	1	May, 1918	1,800
Mangum	5,000	C	Nov., 1914	4	R. B. Snell	1	Jan., 1919	1,800
McAlester	19,000	C	Nov., 1919	1	E. M. Fry	1	Nov., 1919	5,000
Muskogee	50,000	C	April, 1920					6,000
Norman	6,500	C	Sept., 1919	1	W. R. Gater	1	Sept., 1919	
Nowata	8,000	C	April, 1920					
Sallisaw	3,000	C	Nov., 1919	1	Fred E. Johnston	1	Nov., 1919	3,000
Walters	3,600	C	Sept., 1919	1	W. B. Anthony	1	Nov., 1919	3,000
Weatherford	3,000	o	Aug., 1917	3	G. A. Critchfield	1	June, 1919	1,700
Oregon								
LaGrande	6,200	C	Oct., 1913	4	John Collier	1	Jan., 1919	1,800
Pennsylvania								
Altoona	65,000	o	Jan., 1918	1	H. Gordon Hinkle	1	Jan., 1918	7,500
Ambridge	13,000	o	Nov., 1918	2	W. M. Cotton	3	Feb., 1920	4,500
Coraoplis	5,277	o	Mar., 1920					
Edgeworth	2,500	o	Jan., 1914	3	Robert Lloyd	1	Mar., 1920	3,000
Mifflinburg	2,000	o	Jan., 1919	1	Wm. D. Kochersperger	1	Jan., 1919	2,500
Sewickley	6,200	o	Oct., 1918	1				
Towanda	6,000	o	April, 1913	1	W. T. Howie	1	April, 1918	1,200
South Carolina								
Beaufort	3,700	C	May, 1915	4	Hal R. Pollitzer	1	May, 1918	1,800
Rock Hill	10,000	C	Feb., 1915	2	E. R. Treverton	1	Dec., 1919	3,600
Sumter	9,508	C	Jan., 1913	5	W. T. Brown	1	May, 1919	4,000
South Dakota								
Clark	1,500	o	May, 1912	1	J. E. Smith	1	May, 1912	1,200
Tennessee								
Alcoa	3,500	C	July, 1919	1	V. J. Hultquist	1	July, 1919	2,000
Kingsport	10,000	C	Mar., 1917	3	Herbert L. Kidd	1	April, 1920	4,200
Texas								
Amarillo	15,494	C	Dec., 1912	4	S. B. Motlow	1	Jan., 1920	
Beaumont	40,422	C	May, 1920					
Brownsville	13,200	C	Jan., 1916	3	George Groupe	1	Feb., 1920	5,000
Brownwood	10,500	C—	April, 1916	3	E. R. Brashear	1	Feb., 1919	2,400
Bryan	6,295	C	July, 1917	3	H. A. Burger (acting).		Feb., 1920	
Denton	7,000	C	April, 1914	3	H. V. Hennen	1	June, 1919	
Eastland	12,000	C	Jan., 1919	1	Walter Lander	2	Jan., 1919	6,000
Electra	7,000	o	May, 1919	1	W. H. Larson	1	May, 1919	4,200
Lubbock	3,958	C	1918	1	Martin S. Ruby		1918	
Lufkin	7,000	C	April, 1919	1	Lequin Mitchell	2	April, 1919	3,000
Ranger	30,000	C	May, 1919	1				
San Angelo	16,500	C	June, 1916	1	E. L. Wells, Jr.	1	June, 1916	2,500
Sherman	18,000	C	April, 1915	2	O. J. S. Ellingson	1	April, 1916	3,600
Stamford	5,000	C	June, 1918	2	H. J. Bradshaw	1	1919	
Taylor	8,200	C	April, 1914	3	A. V. Hyde	1	April, 1918	2,000
Teague	3,760	o	Jan., 1915	3	C. E. Johnson	1	1919	
Terrell	8,400	C	Aug., 1919	1	J. P. Kittrell	1	Aug., 1919	2,400
Tyler	15,000	C	April, 1915	2	Henry J. Graeser	1	Aug., 1918	3,600
Yoakum	7,500	C	April, 1915	2	J. V. Lucas	1	Nov., 1919	
Utah								
Brigham City	5,000	o	Jan., 1918	2	John H. Burt	1	Jan., 1920	
Vermont								
Springfield	8,000	o	April, 1920					
Virginia								
Bedford	4,500	o	April, 1920					
Blackstone	2,000	C—	June, 1914	1	R. B. Stone	1	June, 1914	1,500
Bristol	7,200	C	Sept., 1919	1	R. W. Rigsby	1	Sept., 1919	3,000
Charlottesville	10,688	o	Aug., 1913	3	Shelton S. Fife	1	Sept., 1918	2,400
Farmville	4,000	o	Sept., 1915	2	Leslie Fogus	1	Sept., 1917	1,400
Fredericksburg	7,000	o	Sept., 1912	2	L. J. Houston, Jr.	3	Sept., 1918	3,600
Hampton	8,000	C	Sept., 1920					
Lynchburg	35,000	C	June, 1920					
Newport News	37,500	C	1920					
Norfolk	200,000	C	Sept., 1918	1	Chas. E. Ashburner	3	Sept., 1918	12,000
Petersburg	25,000	C	Sept., 1920					
Portsmouth	80,000	C	Jan., 1917	2	W. B. Bates	1	Aug., 1917	5,000
Roanoke	47,346	C	Sept., 1918	1	W. P. Hunter	1	Sept., 1918	4,800
Staunton	10,617	o	Jan., 1908	2	S. D. Holsinger	1	Jan., 1911	2,000
Suffolk	9,000	C	Sept., 1919	1	Richard H. Brinkley	1	Oct., 1919	3,000
Warrenton	3,000	o	Mar., 1920	1	L. M. Clarkson	1	Mar., 1920	1,800
Winchester	7,000	o	May, 1916	2	Thos. J. Trier	1	May, 1918	2,000
West Virginia								
Charleston	43,000	C—	May, 1915	3	Bonner H. Hill	1	May, 1919	4,500
Wheeling	80,000	C	July, 1917	2	Chas. O. Ephlin	2	June, 1919	8,000
Canada								
B. C., Kamloops		o	Oct., 1918	1	J. J. Carment	1	Oct., 1918	3,000
N. B., Edmunston		o	Feb., 1920	1	L. Leon Theriault	1	Feb., 1920	3,000
N. B., Woodstock	4,000	o	June, 1919	1	R. Fraser Armstrong	1	June, 1919	3,000
P. Q., Grand 'Mere		o	Mar., 1920	1	Henry Ortiz	1	Mar., 1920	
P. Q., Westmount	20,000	C	April, 1913	1	George W. Thompson	1	April, 1913	

White Way Lighting in St. James, Minn.

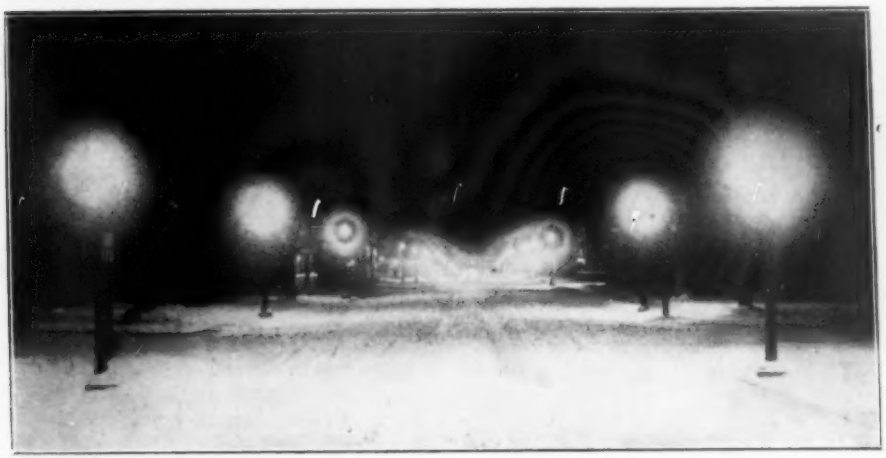
By I. R. Patch

Consulting Engineer, John W. Shaffer & Company, Minneapolis, Minn.

THE city of St. James, Minn., planned an extensive municipal improvement for the season of 1919, including a white way, or street lighting system.

When the white way was first proposed, it met with considerable opposition, but when the benefits were explained to the taxpayers and they realized that if it was ever to be installed it should be done before the paving program was started, most of the opposition was withdrawn. The main arguments advanced in favor of the new lighting system were: from an artistic standpoint, a white way materially beautifies a locality by making the general appearance of the street more pleasing to the eye in the daytime and more cheerful at night; from a business standpoint, a white way makes late afternoon and evening shopping or business more convenient and more desirable and consequently draws considerable trade to that locality or city which has a good lighting system; to a visitor, or a traveler, a well-lighted city gives the impression of being thrifty, prosperous and modern, and this idea, carried away with him, is naturally a good advertisement for the city.

In constructing the system at St. James, the general plan was to stagger the lights. In the business section of the city the standards were placed 90 feet center to center, and in the outlying or residence districts they were extended to about 106 feet center to center. The corner lights, of which there were four for each down-town corner and two for the other corners, were placed 15 feet back from the property line so as to conform with the spacing thru the blocks. This system was carried out thruout the entire city with the exception of the main business corner, the intersection of First Avenue and Sixth Street, where eight lights were placed, two on each corner of the intersection.



NIGHT VIEW OF FIRST AVENUE, ST. JAMES, MINN., ON A WINTER NIGHT

The lights are operated on two separate circuits, one which is turned off at midnight, and another that is left on all night. All the lights are connected with the former, or midnight, circuit, except two diagonal lights on each street intersection, which burn all night.

Two styles of light standards are used: the large standards, 12 feet high, are one-light King posts equipped with Novalux units having white glass diffusing globes and glass canopy tops; and the small standards, 10 feet high, are a different style King post, equipped with another type of Novalux

top. One hundred and twenty-two of the large standards are installed down-town, and in the outlying part of the city ten of the small ones were used.

In installing this system 37,150 feet of No. 8 single-conductor, lead-encased, steel-taped cable, insulated for 7,000 volts, was used for the ground cable. In most places the cable was laid just inside the curb, so that not much excavation or tearing up of sidewalk was necessary.

The posts were all set on concrete footings 24 inches square by 3 feet deep and fastened by means of four bolts embedded in the concrete. In the base of each post was placed a Cutter disconnecting pothead for making the connection between the ground cable and the interior wiring of the post.

Each of the standards was equipped with a 6.6-ampere, series Mazda C lamp of 400 or 250 candle-power each. The current for this system is furnished by the Northern Power Company and is controlled by a 30-kilowatt, 2,300-volt primary and 6.6-ampere secondary constant-current regulator.

This lighting system was designed by John W. Shaffer & Company, municipal engineers, Minneapolis, and The Sterling Electric Company of Minneapolis did the construction work and furnished all material except the standards, which were supplied by the Western Electric Company, of Chicago.

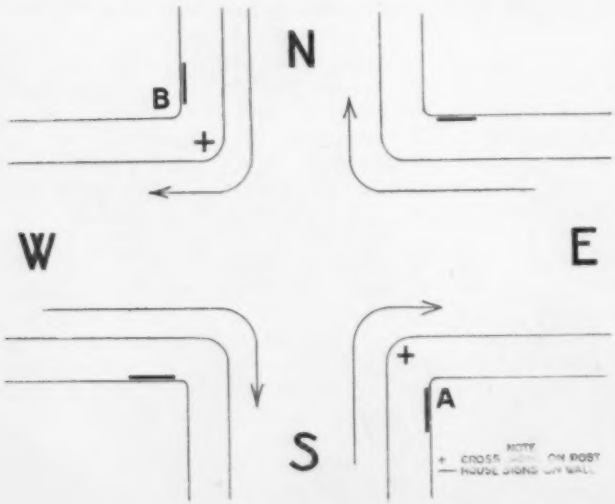
Where Should Name Signs Be Located at Street Intersections?

An Analysis and a Suggested Rational Way of Locating Street Signs

SO many inquiries have been received by THE AMERICAN CITY from various communities asking for the most logical location of street name signs, that it seems advisable to give our readers the benefit of the experience of those who have made considerable study along these lines and whose suggestions have been adopted by a number of large and small cities.

The basic principle involved in the placing of street name signs is nothing more or less than the "rule of the road"; namely, that, in America, traffic should be on the right-hand side of the street or sidewalk. By following the accompanying diagram, the remainder of this discussion will be made clear to the reader.

The sketch assumes the intersection of two streets, one running north and south, and one due east and west. Street traffic is indicated in all four directions making right-hand turns, as is the rule in congested traffic sections in most of the large cities, particularly during the rush hours. All the references are equally true, however, whether left-hand turns are permitted or not.



Traffic, whether vehicular, motor, or pedestrian, proceeds north on the extreme east side of the north-and-south streets; and south on the extreme west side. Traffic proceeding west on the streets running east and west is confined

to the extreme north side, while traffic east on streets running east and west is confined to the extreme south side. With this clearly in mind and assuming that only two posts or pole brackets with street signs at right angles are to be used, it is clear that these brackets should be erected on the southeast and northwest corners to best serve the results sought by traffic rules and, at the same time, to function logically with and to facilitate the prompt movement of traffic itself. Brackets are indicated on corners A and B of the diagram.

If you are walking or driving north, you approach first in proper line of vision the post or pole on the southeast corner of intersecting streets. This condition is true also of traffic proceeding west on streets running east and west, to be noted on corner B. It is not necessary to look across the street on which you are walking or driving in order to find your street sign. It is directly in front of you.

Another point in favor of this system is the assumption that a man walking or driving north and desiring to turn east on an east-and-west street will have the name of the street before him without the necessity of crossing the street which he really desires to turn into.

The same conditions rule the position of street name signs when placed on buildings or walls at street intersections. As shown on the diagram, only four street signs are necessary in either instance, whether for bracket erection or fastened to building. The house signs, indicated by the heavy lines at each of the four corners of the sketch, show on different sides of the same street, but the principle is the same as the former one covering the position of the bracket signs; that is, that for right-hand traffic the sign is always in front of the driver or pedestrian at the side of the street thru which he is driving or walking.

It is to be conceded that, if pole signs can be mounted on all four corners, or house signs on all eight sides of the four buildings at street intersections, so much the better. When only four signs are to be used at street intersections, however, the layout designated on the sketch is probably the most logical, and it has proved the most satisfactory wherever used.

Coöperation in Street Cleaning

By Theodore Eichhorn

Superintendent, Department of Streets and Public Improvements, Erie, Pa.

NO municipal function has been so little understood as that of street cleaning. For years our street departments were considered as the refuge of the wards of our politicians. There was little demand for up-to-date equipment—machinery did not vote, so what was the use?

In time these conditions changed. With the demand for improved streets came the need of cleaning them, and this resulted in a demand for efficiency. Department heads were compelled to adopt up-to-date methods in order to keep costs within appropriations made for street cleaning. Our citizens were not content unless streets were cleaned regularly, and the fact that people took a keener interest in city affairs as years passed by, made it necessary for efficiency to be the watchword.

When labor was plentiful and team hire cheap, many cities were able to give efficient service without the aid of motor equipment. Labor shortage and high cost of team hire, however, in many instances upset plans of street commissioners, and made current appropriations too small to give the street-cleaning service demanded.

It appears to be a universal complaint that our street departments do not receive adequate appropriations. First, sufficient appropriations are not made to allow the purchase of proper and necessary equipment and the proper housing of it. Second, funds set aside for actual work are really infinitesimal, and the fact that it is almost impossible to take from the operating funds the cost of new equipment without seriously crippling operations, accounts in great measure for the lack of necessary equipment for cleaning streets in many cities.

The remedy lies in one direction: educate the taxpayers as to the needs of the

street department. Why should the people demand clean streets from a department the appropriation for which has left it in a state of malnutrition? Then, too, people are more careless to-day in littering our streets than was the case in years gone by. Almost everything finds its way to the street.

As cities grow, and congestion becomes greater, fire regulations prevent the old-fashioned bonfire; the modern method of merchandising in original packages has also added to the list of things which find their way to the street. Lawn clipping, tree branches, old shrubs, excelsior, cartons, and a thousand and one other things add to the litter which must be taken from the streets, not to speak of the dirt tracked on to our pavements from unimproved thorofares.

In the business districts there appears to be riotous competition as to who can outdo all the others in the way of littering the streets. So-called progressive merchants have old barrels and boxes at the rear of their stores, wherein store sweepings are dumped, together with a miscellaneous assortment of papers, etc. Each welcome zephyr sweeping around the block and up and down the alleyway adds to the burden of the street department.

Complain? What are ordinances for? Call the police! But an army of police could not bring about the result that intelligent coöperation would give. Some day our newspapers will conduct campaigns in behalf of clean streets. Our taxpayers and citizens will respond when they know the situation. In the future, our street departments will be as thoroly up-to-date and modern as our fire departments and other city departments.

Many people are truly ignorant of the necessity of coöperating in the matter of keeping city streets clean. During last fall I personally remonstrated with a citizen who had deposited a 24-page newspaper in the street gutter on the main thorofare. Indignant? Why was he paying taxes to have the streets kept clean, when he was "bawled out" for such a little thing as throwing a newspaper on the street! When he was asked what he thought the effect would be if every person who bought a newspaper would throw it upon the street, he appeared suddenly to comprehend the situation. A few newspapers scattered along the street will make a comparatively clean street look as if it had not been cleaned for a week.

For years our merchants used to start in to sweep at the back end of their stores and brush everything into the roadway fronting their places of business. I have repeatedly seen this done on Sunday, after the street had been cleaned early in the morning, and the men had gone off duty for the rest of the day. Stop it? Yes, but it meant the breaking up of personal friendships of years' standing.

Some day our people will realize the value of giving coöperation to the street cleaning department. They will give inestimable assistance by seeing that much litter which now finds its way to the street is disposed of in another manner. Our merchants and business interests will also be wideawake in giving their support toward preventing the littering of the business streets. The natural accumulation of objectionable matter is all that the street department should be called upon to remove from our city pavements.

Next to the problem of preventing the littering of streets comes the question of having our street cleaning done in as cheap a manner as possible. This can be done thru modern equipment. Every city ought to encourage the production of modern street-cleaning apparatus. To my mind, the department which can be thoroly motorized is the one that will give service. But it takes money to buy equipment. Suitable propaganda nationally directed thru our daily press is needed.

Editorial Note.—The foregoing article won first prize in a competition recently announced by the Elgin Sales Corporation for the best article on street cleaning. A goodly number entered the competition and a very creditable group of articles were submitted. The committee of award consisted of George A. Dodge, President of the Elgin Sales Corporation, Arnold B. MacStay, Commissioner of Street Cleaning, New York City, and Edgar J. Buttenheim, President of The Civic Press.

The Planning of a New Town

The Example of Dawson, Colo.

By Russell V. Black

THE small community gains by coming early to civic consciousness and to the adoption of a general scheme development, farsighted, systematic, scientific.

There are many reasons for early city planning, chief among which are the avoidance of the unfavorable conditions which have been experienced by all large cities and which are largely the result of haphazard growth; and again, the provision for happy and wholesome living conditions for its citizens. In planning for a new town the sources from which it springs should be taken into account—its geographical location, topography, natural resources, future industries, the probable character of the people, and many other factors.

While every community has its individual problems, there is no community that cannot gain something from the experience and general problems of other cities. This experience is to some extent available in books and other publications. Chief among these are "The Garden City," by C. B. Purdom, giving an account of Letchworth, England (E. P. Dutton & Company); "Town Planning for Small Communities," by C. S. Bird, with special reference to Walpole, Mass. (D. Appleton & Company); "The Little Town," by Harlan P. Douglass, containing a good bibliography (The Macmillan Company); and "The Industrial Village," by John Nolen (a pamphlet of the National Housing Association).

There are instances in which the problem is not the taking up of the loose ends of a village already begun, but the planning of a new city. Here is an opportunity, especially for places which aspire not to large population, but to a social unit having the advantages of a small city, combined with the retention of the advantages usually obtained only in the more open country. It is possible to plan so as to avoid both the unwholesome massing and congestion of population thru the herding of great numbers, and the usual limitations and drabness of life characteristic of a sparse population.

This article is written with the idea of

THE SITE OF THE PROPOSED TOWN OF DAWSON, COLO., IS IN THE MIDDLE OF THIS BROAD BOTTOM-LAND

presenting concretely the methods and advantages that are possible thru the planning of an entirely new community. The example is that of the plan for Dawson, Colo., prepared in the office of John Nolen, town and city planner.

The City's Site

The proposed site of Dawson is on the broad bottom-lands and surrounding bluffs of the fertile Yampa River valley in Routt County, northwestern Colorado. The surrounding country is very thinly settled, and very rough and difficult of access. There are a few settlements along the river and the railroad. The nearest city of any considerable size is Denver, 200 miles to the southeast. The chief industries of the locality are coal mining and general farming. Some small fruits and vegetables are grown largely for local consumption, and there are a few stock ranches.

The Denver and Salt Lake Railroad cuts across difficult ridges and thru river valleys over into the Yampa Valley, thus connecting the region with Denver. It is now contemplated to extend a branch road from the Union Pacific south to Dawson. This will open the valley to the north and northwest, will help to reduce haulage difficulties, and will extend the range of market for coal and farm products. The coal mines are at present being worked far under capacity, because of inadequate shipping facilities. They are ripe for development. With adequate provision for disposal of products, greater facilities will be needed for housing and caring for labor. The agricultural land is attracting farmers and is being rapidly settled. Where now exist a few scattered ranch houses and broad grazing land there is the demand and splendid opportunity for the development of a small city, a complete town unit entirely self-contained.

Studying the Problem

A group of men, including a number interested in the mines, seeing the opportunity for such a city and realizing its possibilities, formed the Dawson Land Company, which proposed the planning and development of a small community. They believed that the scheme should be coöperative, that the town should be planned for the mutual benefit of the miners who might be expected to make Dawson their home, and of their employers. They realized that the people they expected to bring here to work for them would have to be housed well; that they would have to be fed largely from adjacent farm land; that their children would have to be educated in local schools; and that recreation would need to be provided by local entertainment and activities.

They knew that to obtain the sort of labor they wanted and to retain that labor in its full efficiency, it would be necessary for them to provide for that labor all the things that are fundamental to happy and wholesome living; so they went about planning a real town.

The first step in the procedure was to obtain satisfactory maps. These maps included: (1) a state map showing the relation of Dawson to the large centers of population within the state, and also its relation to the mountain ranges, rivers, and railroads; (2) a county map, showing a more detailed relationship with local topographical and structural features; and (3) a map of the immediate proposed town site, showing all existing conditions, including topography, existing buildings, roads, railroads, rivers, etc.

The next step was a questionnaire, covering all existing and probable future conditions which might in any way affect the original planning and development of the town. This was sent to representatives of the Land Company.

Then an experienced man from the city planner's office visited the proposed site and looked over the surrounding territory.

Upon the basis of these maps, the questionnaire and the result of the city planner's observations, a careful study was made, resulting in a preliminary plan of development which was drawn up and presented to the company.

The study brought out many interesting conditions and problems. In the first place, the site is in an east-and-west river valley. To the south the valley stops at the bluffs, back from which extends a low plateau or mesa reaching to the foot of the mountain range. To the north the broad valley land gives way quickly to the mountains, with little intervening upland. All traffic ways follow the east-and-west line of the valley. The railroad, following the general line of the valley and river, at this point cuts across the bottom-land and divides the town site into north and south sections.

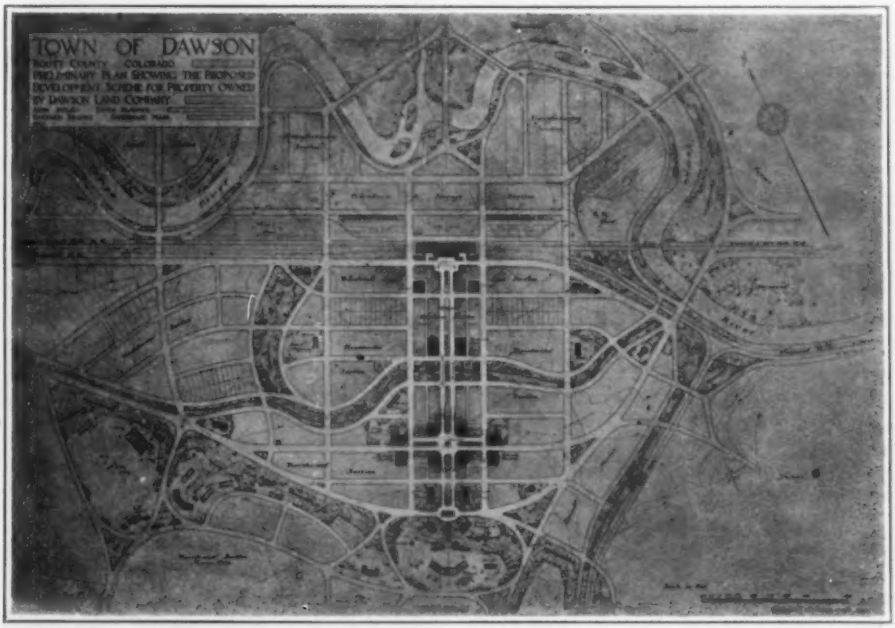
Zoning the Town

The first problem was the general apportionment of the land to the various needs, including residential, business, industrial and agricultural areas, striving at the same time for the greatest efficiency and most wholesome and attractive living conditions, while taking the best possible advantage of topographical features. The existing railroad, running east and west, forms a definite division thru the town site. This line provides a natural separation, offering opportunity for the location of business and residential sections to the south, and of factories, yards, and industrial plants to the north. This seems a favorable distribution, because the prevailing winds from the south will carry the dirt, noise, and smoke of industry away from the main part of the town. It has the further advantage that the railroad will be made to serve as a broad fire belt.

With this general division in mind, land will be apportioned on the north to factory sites, warehouses, storage houses, and railroad yards, and on the south to wholesale and retail business districts, residential section, parks and public buildings, etc., while on the outskirts of the town, north, east and west, land will be reserved for farms.

The Street Layout

The next problem was that of circulation and the subdivision of these various areas with a view to efficiency and beauty. The natural trend of the traffic is east and west along the valley. In all probability this will become the natural direction of the growth of the town, but it was felt that the original town site should become a definite civic center, and to this end traffic should be to a certain extent halted. This is to be accomplished by laying some of the main streets of the town across the valley. Mountainview Avenue will be located at right angles to the valley traffic, and at approximately the center and broadest part of the valley. This will afford a good balance to the town, and a desirable relation to the bends of the river and the territory beyond. It will be oriented so as to give an axial view of Wolf Mountain to the north, and will be made further attractive and fitting as a main street by the location, at definite points along its line, of the various groups of public buildings; and by the loca-



PLAN OF DAWSON, COLO., A PROPOSED NEW TOWN DESIGNED FOR THE DAWSON LAND COMPANY

tion of the railroad station at one end, and the termination of the other end with a large resort hotel located on the level land at the top of the bluffs.

Paralleling Mountainview Avenue, there will be laid two wide streets planned to relieve the main business street and to provide a district convenient and adequate for business expansion.

The east-and-west traffic thru the valley will be taken care of by three main roads branching from the county highway and leading across the town, one by the railroad station, another along a parkway following the line of an old irrigation ditch, and the other dividing into two lines, one passing thru the town center and the other thru the public buildings group.

Other streets will be located to reach all parts of the town easily and directly. Advantage will be taken of the breaks in the bluff leading to the mesa to provide good connections between the upland and the valley. The river will be bridged to tie the farmland north of the site directly into the town plan.

The three principal building groups, will all be located centering upon Mountainview Avenue. These three groups are to be: (1) a group of stores for retail business; (2) the town center group, including the bank, theater, post office, and an office building built by the Dawson Land Company; and (3) the city group, providing sites for a municipal building, a county court house, a library, and a grange hall which might also contain an agricultural school and exhibition hall.

In addition to these special centers, area will be reserved for building sites for schools, fire stations, a high school, churches, a resort hotel and grounds, a hospital group, a market house for the use of local farmers in selling produce from wagons or stalls, a city market, a garage, a coöperative store, an inn, a gasoline station, etc.

Parks and Other Recreational Features

Certain areas of natural beauty, most of which are not favorable to other development, are to be set aside for parks. They include the steep bluffs in the residential section, impractical as building sites; the borders of the irrigation ditch, which will desirably be left open, and will serve as a line for an attractive parkway; a sunken depression near the railroad track, undesirable for building, but easily made into good park land; the banks of the river, which might otherwise be diverted to undesirable usage; and the various little triangles and squares about the city which could not be used to other advantage.

It is further proposed that a cemetery of the park type be located to the south, and at least a mile and a half from the center of the town.

Recreation areas will be provided, and include: school playgrounds, a large athletic field for the high school, a drill and aviation field, county fair grounds, and a golf course in connection with the hotel.

The Housing Provisions

Following this plan of layout, the policy of the Land Company is to place before a sufficient number of miners and others who go to make up a complete social unit, the advantages of living in Dawson, and to encourage them to come to the town and make their homes there permanently. Building sites will be sold outright, with certain definite restrictions, to those who wish to live in the town. The smallest lots, which are 150 x 60 feet, afford opportunity for gardens. Small farms are to be designated and sold to those desiring them. Factory sites have been set aside and small industries will be encouraged. The company will undertake some initial development, including the building of houses, a business block, and an inn or hotel, but with the view of selling or leasing them as opportunity arises later. It is not the intention of the company to operate any store or other public facilities, but to encourage the building of stores, etc., by private interests as demand arises. As soon as there is sufficient population, it is planned that the city be organized under and governed in accordance with the state laws.

In brief, Dawson is an example of a far-sighted, broad-minded policy, which, recognizing the need for and possibilities of a well-planned city, has looked far into the probable future needs of that city and has planned to meet them efficiently and economically.

Developments in Brick Pavement Construction

A History of This Type of Paving in the United States

By M. B. Greenough

NEARLY all brick pavements laid before 1895 were filled in the joints with sand or bituminous material. For many years they were laid upon natural foundations. Comparatively slight attention was paid to variable conditions of subsoil drainage and other factors in soils measuring their supporting power. Artificial bases had their inception in the belief that thus might imperfectly drained or consolidated subgrades be bridged over and settlements in weak spots prevented. The cushion or bedding beneath the brick was primarily intended to compensate for unevenness in the surface of the base. Sand and bituminous fillers continued to be used after the construction of artificial bases became general and after functions without number in addition to these mentioned had been ascribed to artificial bases.

With fillers of these kinds, chief reliance for the durability of the pavement as a whole was placed in the wearing qualities of the individual service units. That confidence was not misplaced is proved by the very large numbers of these old brick pavements in all parts of the country that are now in service, many of them laid long before 1895.

At the time of which we are speaking, there had not been developed a bituminous filler that could meet the much-specified requirement that "it shall not flow in hot weather nor become brittle in cold weather." The result was that as soon as the filler had left the joints, the edges of the brick cobbled. Pavements then became noisy, naturally enough, when traversed by iron-tired vehicles. Nor could the open joints be justified in view of the increasing demand for clean streets.

The development of cement-grout-filled brick pavements grew out of these conditions. The hard filler, it was thought, would protect the edges of the brick. Cobbling under traffic would be prevented, and at the same time a surface promoting maximum sanitation would be provided. Moreover, it was believed that the firm bonding of each brick to its neighbor would furnish a monolithic wearing surface reflecting all the inherent service-value of the individual brick composing it. Just as the sand cushion had been used with sand and bituminous fillers, it was continued in use with cement grout, purely on the basis of precedent.

Many millions of square yards of brick pavement, cement-grout-filled on the sand cushion, were built in the period from 1895 to 1915. This type came to be regarded as the all but universal type in the East, the South, and thruout Ohio, Indiana and Illinois. Of the West we shall speak later. But east of the Mississippi River this type of brick pavement almost became the single standard.

It became increasingly apparent, however, in observing this type in service, as built under average working conditions, that the sand cushion was a tricky and dangerous element of the structure. Uniform compression was the exception rather than the rule. In all too many cases, patches of the surface were broken down. The brick themselves have given the appearance of being crushed under traffic. But it was soon discovered that the real cause was in an imperfectly compacted sand cushion. The sand would be forced into the joints from below when the surface was rolled. In many cases the filler would enter the joints only a fraction of an inch. A force was therefore exerted upon only a fraction of the face of the brick, sufficiently concentrated in many instances to snap off entire tops of brick.

The sand cushion and grout-filled type, which it was possible to build satisfactorily thru care and watchful supervision, was finally found inadvisable for further use. The hazard was too great. It was satisfactory neither to the public, to engineers, nor to the paving brick industry.

Construction of Green Concrete Foundation Type

The solution seemed to be found in the development in 1914 of the green concrete foundation type and the semi-monolithic type of brick pavement. If the literature of the period from 1914 to 1916 is consulted, the constantly reiterated belief that the principal merit of the two types lay in the elimination of the hazard of the sand cushion will be found. That belief has been justified in the facts. It has also been proved, as it was predicted at that time, that longitudinal cracking, common to the sand-cushion type in frost latitudes, while not altogether eliminated, has been reduced.

There can be no question as to the improvement effected in cement-grout-filled brick pavements by supplanting the plain sand cushion with a mixture of cement and sand or by laying the brick in the green concrete. It must be pointed out, however, that from the time cement filler was introduced, highway engineers had to deal with the problem of the paving slab. A condition of unsatisfactory joint filler needed to be remedied. Unquestionably, the remedy gave the desired edge protection to the brick, but it likewise introduced hazards of its own, for the relief of which we must await a more definite and complete knowledge of slab pavement stresses and strains.

The history of brick paving has been one of a continual seeking for a filler that would furnish the required edge protection to the brick, so as to form a smooth and sanitary surface and at the same time to cause the pavement surface as a whole to bring to a maximum the wear-resisting properties of the single unit.

A Filler Developed

So far this discussion has largely covered that section of the country lying east of the Mississippi River. In the West the early improvements followed the practice of the East. Being in the field of large-scale asphaltic oil production, this section naturally turned to the use of asphalt fillers. On account of asphaltic oil's being a native product, an effort was made to improve it for its several uses, brick-paving filler among the rest. For many years there was no special ground for thinking that extraordinary progress was being made. But while the East turned from bituminous to cement grout filler, the West persevered in attempting to improve its asphalt filler.

The fillers produced showed increasing stability under high temperatures and less brittleness under low. Since 1912 an asphaltic filler that does meet the situation has been generally used in brick pavement construction. The second outstanding development in brick paving practice in 1919 has been the rapid growth in the amount of this filler used in all parts of the country and in the yardage projected for future construction.

The Standard Brick

Third among the developments of the year now past has been the increase in the use and specification of what is being styled the standard brick—namely, the 3 by 4 by 8½-inch plain wire-cut brick. Already well-established thruout the West, its use has spread during the year to points east, thru Illinois, Indiana and Ohio, and with respect to the absence of lugs, Pennsylvania, and in the South.

Prior to 1895 nearly all brick laid measured 2¼ by 4 by 8 to 9 inches. They were plain wire-cut and unrepressed. They were thoroly well-vitrified brick; so much so that they were sometimes somewhat irregular in shape. But they did possess beyond question unequalled wearing qualities. They were very tough and very hard. It was at about this time that agitation began among engineers for a brick of more perfect shape. The response of the paving brick industry was the brick of the so-called block size—3½ by 4 by 8½ inches.

Coincident with the standardizing of the block size came the addition of projections or lugs for spacing. The plain wire-cut brick had done their own spacing. With the extreme regularity that was expected with repressed brick, the lugs were deemed necessary. With perhaps equal weight, the argument for foothold for animals was advanced as an additional reason. The fact that cement grout filler had come into use did not have a great deal of influence as far as lugs were concerned until engineers began to use the coarse grades of sand in the grout. It is also true that the rounded edge of repressed brick assisted, rather than otherwise, the entrance of sand cushion into the joints from below.

Once the block size of brick began to be

made by all manufacturers, there was practically no change in the size or shape of brick until 1910, when there was developed west of the river the wire-cut brick 3 by 4 by 8½ inches in size, having two instead of four lugs formed by the die instead of being repressed. There were produced east of the river contemporaneously wire-cut-lug brick that aimed to recognize the demand for the advantages of wire-cut as against repressed brick. In size no change was made from that of the repressed brick. The edges of this and the wire-cut brick west of the river were square, whereas repressed brick were round-edged.

The wire-cut brick seems to be generally preferred by engineers for all brick construction. And with the passing of the repressed brick there seems also to have passed the height of the demand for lugs.* They were dropped from the brick previously mentioned as having them formed by the die, more than two years ago. And in the 3 by 4 by 8½-inch size they are being increasingly regarded by engineers as superfluous.

Modern Conditions

No longer can it be said that there is a universal type of brick or other pavement. Engineers ask, "Do we use standard footings for all columns in high building construction? Do we use standard designs for every bridge pier, for all dams, for each retaining wall?"

The answer of course is "no." Yet these are comparable departments of engineering. Each of these structures is called upon to support loads, and each rests upon whatever soil foundation is available in each case. We must bear in mind also that each of these is a localized structure with a minimum expectation of variation in subsoil beneath it. Yet we very well know that subsoils and surface soils vary noticeably within short distances.

In spite of the precedent for individual designing thus established for structures resting upon the earth, it has been ignored to a great extent in road construction. Engineers have not insisted that subsoil and surface drainage should be made as perfect as possible.

Drainage has been neglected to the point of being ignored, as has also the known fact that soils vary within short distances and that saturated subsoils accord little if any bearing value for the pavement structure, for we have required the construction of "standard" types of pavement without regard to these conditions. It is not unusual for the same kind and depth of base to be specified for a road 12 miles long. If the section is adequate for the worst condition, then it is extravagantly designed for every other condition.

Extravagance is not compatible with sound engineering. The fact that in one locality a brick pavement, for example, has been built on a 4-inch concrete base is not justification universally for that depth. Conversely, it does not follow that because a 6-inch base seems to be needed in one place, the same depth is required a mile away.

The time is not far distant when a single stretch of pavement will be designed in short sections. In a given contract for a single road there may be concrete base, rolled stone, gravel or slag base; each one may be anywhere from 4 inches upward in depth. If we carry the thought to its logical conclusion, there may be portions requiring no artificial base.

Individually designed roads are a necessity. The use of blanket types is wasteful. It ignores the fundamental principles upon which the character of the profession's public service is founded. It cannot endure.

As nearly correct a description of a slab pavement as we can now write is this: It is a continuous slab resting upon a continuous support of varying elasticity, to be designed to carry moving loads. As yet we have not a proved analysis of such a structure. The nearest approach to it will be found in the analysis of rail stresses, and as far as this work has proceeded it is based upon results secured by the use of an extensometer under actual service conditions.

It will also be recalled that the simple beam theory is based upon positive bending moments. There are no negative moments in a simple beam. When beam or slab continuity is introduced, however, we have set up a consideration of negative moments. Under moving loads a negative moment

* The discussion of this point brought out considerable difference of opinion among the engineers present, many being loath to give up too quickly the use of bricks with lugs which uniformly space the blocks when laid and provide ample space for the filler.

moves in advance and in rear of the load and is effective in the vicinity of the support. Witness the analysis of continuous beams on fixed supports. Just what happens on elastic supports is yet to be shown.

Admittedly, this discussion is theoretical. Fortunately, we have recent data presented by the U. S. Office of Public Roads derived from the measurement of the effect of motor trucks upon pavement surfaces, to show that the principal force of traffic to be met is impact and not bending.

What, then, can we do while awaiting the production of scientifically determined data that can be used with the backing of proof? The answer to that question is clear. We should return to first principles. We should place ourselves upon the safe ground of minimum hazard.

In the end, that means a much more discriminating use of cement grout filler as far as brick pavements are concerned. It means that in many cases concrete bases will be supplanted by another type—the rolled base. It means the passing of standard cross-sections of pavements of all types. And these things mean laying the foundation of real economy in pavement design.

The coming of a saner period of pavement design is evident. Already the reaction against slab pavements is setting in, and the rolled base is in the ascendency. We should not forget that there is more than one type of rolled base. Some are water-bound, some tar-bound, some bound with dry screenings. Local stone secured by the roadside is adequate. The keynote of this type, as it should be of all types of base, is sufficient serviceability at minimum cost.

Specifications

Engineering specifications more and more recognize the principles that have been discussed above. Specifications are becoming specifications of details. There are concrete, rolled stone, gravel and slag bases bound with screenings and with tar. There are asphalt filler and sand, cement grout or combined tar and asphalt fillers. The sand cushion will be specified to accompany bituminous and sand filler, the cement sand bed or the green concrete base where cement grout filler is used. The specifications will be published in sections. By proper selection a type of brick pavement can be specified that will meet local conditions with economy.

To sum up the case of brick pavements at the beginning of 1920, based on the indications of 1919, we may state these points as clearly defined:

1. The value of thoro subsoil drainage is becoming realized, and is more and more being made an integral part of construction.

2. The use of a variety of kinds of bases to meet different subsoil, traffic and economic conditions is firmly established.

3. The tendency of design is away from the slab types of brick pavements and toward the types that depend upon the quality of the individual unit as against the monolithic surface.

4. Cement grout filler is being used with more discrimination.

5. The coming year may see the widespread adoption of the standard brick in localities now laying numerous varieties of lug brick.

Acknowledgment.—From a paper read before the annual convention of the American Road Builders' Association, Louisville, Ky.

"For 1920—More Light"

Cincinnati to-day is a bigger, better, brighter city because of the boulevard lighting system. This plan of illumination has proved its value as a modern metropolitan municipal asset beyond question. In the business sections where it has been installed, this notable improvement has been a magnet in drawing trade, and has added much to the prosperity of Cincinnati.

The Queen City stands upon the threshold of an era of unprecedented prosperity. Improvements which have demonstrated their worth, should be extended in keeping with this program of expansion. Of primary importance is the extension of the present boulevard lighting system. In addition to its commercial value, this system of illumination assures a safer, cleaner city in which to live. Crime and filth disappear when exposed to light. —From an editorial in the *Cincinnati Enquirer*.

Modern Methods of Sewage Disposal

An Illustrated Delineation for Municipal Officials

PART I

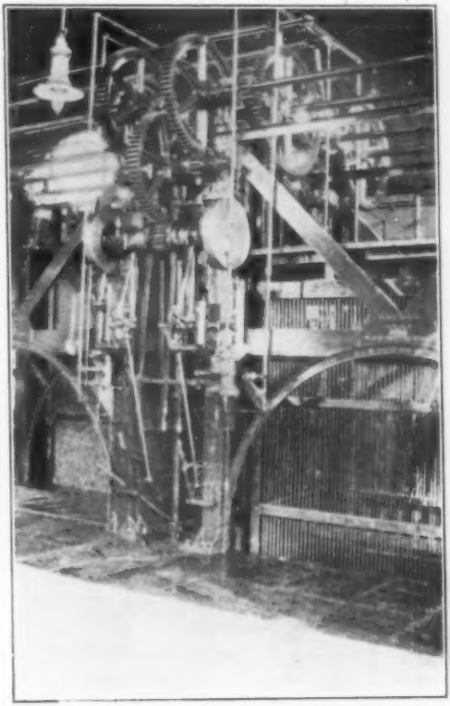
By E. S. Chase
Sanitary Engineer

NO living organism can long exist in the midst of its own wastes. This is as true of the municipal organism as of the individual. From the days of Moses the necessity for the proper disposal of human excreta has been recognized by the race. The problem of sewage disposal, however, with which we are confronted today originated only some sixty or seventy years ago. Prior to that time the disposal of human wastes was largely a duty of the individual, and only with the adoption of the water-carriage system did sewage disposal become a civic responsibility.

In the early days of the water-carriage system the easy way of allowing sewers to discharge into the nearest watercourse was adopted, a way all too frequently and indiscriminately practised in modern times. So long, however, as the volume of the stream receiving sewage was large compared with the volume of sewage received, little thought was given to whether this method of disposal was desirable or otherwise.

The results of indiscriminate discharge of sewage into streams are various. In Europe, where the streams are smaller and the population more dense, local nuisances due to the fouling of the streams brought about, at a comparatively early date in the history of sewage treatment, the adoption of methods designed to reduce the organic pollution from sewage entering the watercourses. As soon as the germ theory of disease came into general acceptance and the relation of polluted water-supplies to the prevalence of typhoid fever was clearly recognized, steps were taken to treat sewage and to purify water-supplies. Furthermore, in certain instances, sewage treatment works have been installed to minimize the danger arising from the sewage pollution of shell-fish grounds. In England the pioneer work in sewage disposal began about the middle of the last century, and in the United States about 1890.

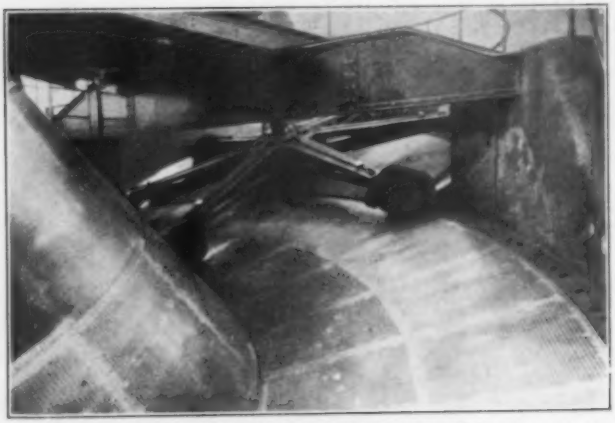
As a result of early experiments and of the practical application of the scientific results of these experiments in subsequent years, it may be stated that sewage purification is essentially dependent upon the oxidation of the organic matters in the sewage thru biological agencies. Bacteria and other micro-organisms in soil, water or artificial devices, if given an abundance of oxygen, oxidize complex, putrescible organic compounds to simple, non-putrescible inorganic substances.



BAR SCREEN USED AT NUT ISLAND, BOSTON, MASS., TO REMOVE COARSE MATERIAL BEFORE SEWAGE FLOWS INTO OUTER HARBOR

Sewage Defined

In order to clearly understand the intent and purposes of sewage treatment, it is



A RIENSCH-WURL SCREEN SUCCESSFULLY USED IN MANY CITIES IN THE UNITED STATES AND IN EUROPE

essential to understand the nature and characteristics of sewage itself. Sewage has been defined as the water-supply of a municipality after use, containing the wastes of man and of his activities. Roughly speaking, sewage contains 1 part of solid matter to 999 parts of water. Of the solid matter, about one-third is in suspension and the other two-thirds in solution. Furthermore, about one-half of the solid matter is organic and the other half inorganic. It is the easily putrescible character of the organic matter and the harmful bacteria which to a large extent bring about the sewage problem. The various methods of sewage disposal are designed, therefore, to remove, within practical limits, these objectionable constituents. In other words, the aim of proper sewage treatment is to prevent nuisance from the decomposition of the organic solids and to prevent, so far as possible, injurious effects to health from disease bacteria.

Disposal by Dilution

Whenever sewage is discharged into a body of water, natural processes immediately begin its purification, microscopic and other living organisms in the presence of the oxygen held in solution in the water tend to oxidize the organic matter, and unfavorable environmental condition relating to temperature and food supplies bring about the destruction of large numbers of harmful bacteria. Under some conditions sewage disposal by dilution is both practical and scientific, but its feasibility in any specific case can be determined only after careful study of local conditions.

Various authorities estimate that where stream flows exceed 4 to 7 cubic feet per second per thousand inhabitants contributing sewage, there is little danger of nuisance or objectionable conditions in the streams. In the case of large lakes the adaptability of disposal by dilution depends largely upon conditions with respect to the location of outlets, currents, water-supply intakes, etc. In the case of tidal waters the matter of the sanitary protection of shell-fish grounds and of bathing beaches may require consideration.

While this method of disposal by dilution is probably the one most widely used, the increasing population of our cities and the ever-increasing discharge of wastes into our streams are bringing about in many instances the need and demand for some degree of sewage treatment before discharge into the watercourses. The undesirable effects of unrestricted sewage discharge in producing obnoxious conditions in bodies of water within city limits, in endangering water-supplies and in destroying fish life needs no elaboration.

Screening

In cases where disposal by dilution may be practiced and yet where the removal of floating solids consisting of garbage, rags, paper, sticks, etc., is desirable, screens are frequently used. Screening is also used almost always in connection with more elaborate methods of sewage treatment and to protect pumps where sewage pumping is necessary. There are many types of screens, the type most frequently used being the inclined bar screen with spacing ranging from ½-inch to 6 inches. Of recent years more elaborate mechanical screens have been installed in a number of instances where a greater degree of solids removal has been desired.

Two of the most prominent of these mechanical screens which have been used in this country are the Riensch-Wurl disk screen and the Reading cylindrical screen. Of the two, there are more installations of the former.

The Riensch-Wurl screen consists essentially of a slotted metal disk, 8 feet or more in diameter, revolving slowly around a shaft inclined slightly from the vertical in such a way that any particular portion of the disk passes alternately in and out of the sewage flow. Floating and suspended solids too large to pass thru the slots in the disk are thus held back and are removed from the disk by revolving brushes, which clean the slots of that portion of the screen which is out of the sewage flow. The size of the slots varies, ranging from 1/64- to 1/16-inch in width by 2 inches in length.

The Reading screen is a horizontal cylindrical framework of steel, 6 feet or more in diameter and about twice as long, upon which removable segments of fine-mesh screen, 40 meshes to the inch, are fastened. The sewage enters the inside of the cylindrical screen at one end, passes thru the fine-mesh screening, leaving behind a considerable amount of solid matter. As the screen slowly revolves, the screenings are conveyed by a worm to the end opposite that at which the sewage enters. From the outlet end of the screen the screenings can then be collected and disposed of. The screen is kept clean by jets of water.

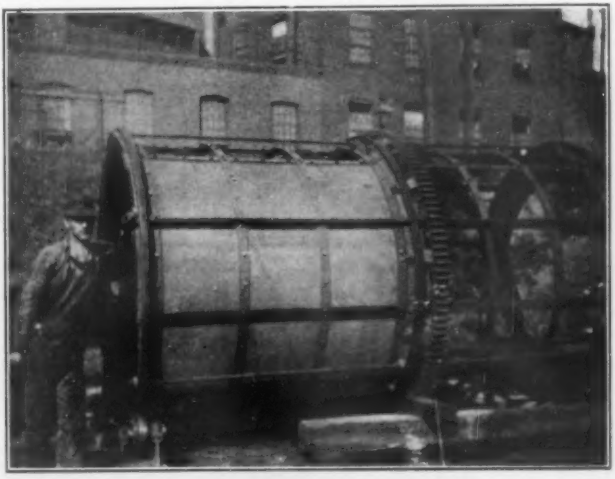
The amount of solids removed by fine screens varies, of course, with the amount originally in the sewage and with the size of the screen openings. Figures from various installations indicate a percentage removal of suspended solids varying from as low as 5 per cent to as high as 30 per cent.

The screenings are very wet, of disagreeable odor and highly putrescible. It is important, therefore, that their disposal be accomplished as soon as possible. This may be done by incineration, by burial in suitable soil, or by mixing with garbage which is to be subjected to reduction.

The operation of mechanical screens requires constant oversight, and repairs are frequently necessary. In the case of a screen under the author's observation a few years ago, the cost of operation was estimated at about $2 per million gallons of sewage treated, and of this cost about one-half was for repairs.

Grit Chambers

In the case of sewage from combined systems of sewage where considerable amounts of sand or grit are present, it is usually advisable to install grit chambers. Grit chambers are small sedimentation tanks thru which the sewage flows at considerably less velocity than in the sewers, but still at sufficient velocity to prevent the settling out of all but the heavier inorganic solids. The removal of grit protects pumps, and where tank treatment is subsequently used, prevents heavy solids from interfering with the removal of sludge. The velocity of flow in grit chambers is usually about 1 foot per second, and the time required for the sand to settle out is approximately one minute. Roughly, the volume of material removed by grit chambers varies from 6 to 12 cubic feet per million gallons of sewage. Grit chambers should be provided with two compartments to facilitate cleaning. The material removed is largely inorganic and can be disposed of by filling in waste places.



A WEAND SCREEN USED AT READING, PA.

Settling Tanks

For many years tanks for the removal of sewage solids have been used, both with and without the aid of chemicals. There are several types of tanks, such as plain sedimentation, chemical precipitation, "septic," and two-story tanks.

Plain Sedimentation

The plain sedimentation tank, as its name implies, is simply a tank for settling out the suspended matters from sewage. Such tanks may be rectangular in plan, shallow or deep, with flat bottoms or a series of hopper-shaped bottoms, and with the flow in a horizontal direction. These tanks may also be square or circular in plan, with comparatively deep hopper bottoms and with vertical flow. In the case of flat-bottomed tanks it is necessary to drain off the supernatant liquid at times of cleaning before removing the sludge. For this reason it is essential that such tanks be built with at least two compartments, so that one compartment can care for the sewage flow while the other is being cleaned. In the case of hopper-bottomed tanks, the sludge may be removed while the tanks are in operation, the sludge pipe being located at the bottom of the hopper, the pressure of sewage upon the sludge serving to force it out thru the sludge pipe when the valve on this line is opened.

Plain sedimentation tanks are cleaned at intervals varying from every four weeks in summer to four months in winter. The object of the frequent cleaning is to prevent very active decomposition of the deposited solids and the formation of an offensive scum on the surface of the tank. The sludge removed from tanks of this type varies from 2 to 5 cubic yards per million gallons of sewage treated, the amount depending upon the strength and character of the sewage and the design and operation of the tank. This sludge will usually contain about 90 per cent moisture and will be more or less offensive according to the time of year it is removed. The percentage removal of suspended solids will also vary according to several factors, the two principal ones being the velocity of flow and the period of detention. Generally speaking, the velocity of flow should be in the neighborhood of 0.2 inch per second, and the detention period from 2 to 6 hours.

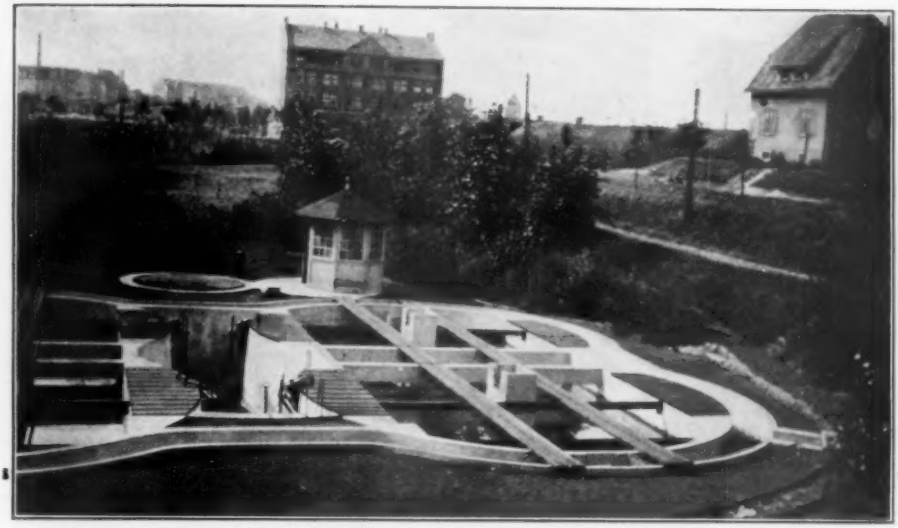
Chemical Precipitation

In order to increase the amount of suspended solids removed by sedimentation, the use of chemicals has been resorted to in certain cases. The method consists mainly in applying the chemicals to the sewage before it enters the settling tank. The chemicals used are generally lime and copperas (iron sulphate). These, when applied to the sewage, settle out in the form of an inorganic floc, which carries with it the particles of suspended solids. This method produces a greater removal of solids than plain sedimentation, but is considerably more costly and produces a much larger volume of sludge. The percentage of solids removed by this method is relatively high, dependent upon the amount of chemicals applied, the velocity of flow, and the detention period in the tank. Generally speaking, chemical precipitation is being installed comparatively infrequently at the present time, and then only in instances where industrial wastes require special treatment.

An interesting type of chemical precipitation is the lignite method used in Coponik, Germany. This consists of adding finely ground lignite and crude alum to the sewage. The resultant sludge is dried and burned as a fuel.

Septic Tanks

The so-called septic tank is essentially a sedimentation tank, so designed and operated as to permit the decomposition of the deposited solids or sludge to proceed in the absence of oxygen. It was originally thought, and even to-day it is rather widely believed, that this decomposition of the sewage solids would continue to such an extent that the sludge would be nearly completely liquefied in time and pass off with the effluent of the tank. The actual amount of solids thus liquefied is much less than at one time believed, and the disadvantages of this type of tank are such that few of them are now being installed. Compared with the plain sedimentation tanks, the septic tank is operated at much longer intervals without the removal of sludge. This has the disadvantage of producing a floating mat or scum of considerable thickness, which becomes very difficult to remove. In fact, the tendency is for the decomposing sludge to rise to the surface and



A TYPICAL GERMAN IMHOFF TANK INSTALLATION AT STAPPENBURG, ESSEN-AM-RUHR
The distinctive feature of this installation is the rounded channels which conduct the sewage to the tank. Square corners where eddies may form are rigidly eliminated

to remain there held up by entrained bubbles of the gases of decomposition. Furthermore, the effluent of a septic tank is offensive to both sight and smell and somewhat difficult to treat by oxidizing processes.

Two-Story Tanks (Imhoff and Travis)

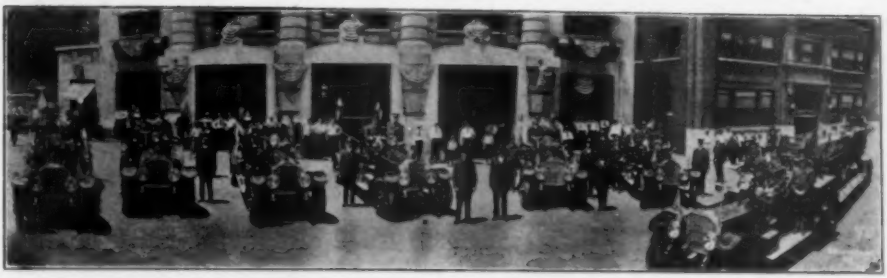
In order to combine the advantages of plain sedimentation and septic action for the digestion of the sludge, two-story tanks were devised several years ago by Imhoff of Germany and by Travis of England. This type of tank consists essentially of two vertical compartments, separated from each other by a false bottom, the upper compartment serving for sedimentation, and the lower for sludge storage and digestion. The false bottom is provided with slots so arranged that solids settling out in the upper chamber can pass into the lower chamber, and at the same time sludge or gas cannot return thru these slots into the settling compartment. This type of tank permits the sewage passing thru it to remain practically unaffected by the septic action taking place in the sludge.

The Travis tank, unlike the Imhoff, allows a portion of the flow to pass thru the sludge chamber with the aim of removing the soluble products of sludge decomposition. The Travis tank also attempts to remove a portion of the finely divided non-settling solids by means of plates suspended in the liquid in the settling compartment. The function of these plates is to attract and accumulate the minute particles of solids until a settleable mass is formed, which sloughs off and thence settles into the sludge compartment. In these two-story tanks the digestion of the sludge proceeds apart from the main body of sewage flow. The sludge compartments are designed to permit the storage of the sludge during the period of the year when low temperature retards the rate of decomposition. The sludge compartments are provided with gas vents to allow the escape of gas from the decomposing sludge. The sludge produced in these tanks is usually considerably less putrescible than that from plain settling tanks or septic tanks, with a lower moisture content and of such consistency as to dry more easily. Trouble is occasionally caused by the foaming of gas thru the vents.

The Use of Motor Trucks Thruout Municipal Departments Effects Savings Appreciated by the Taxpayer

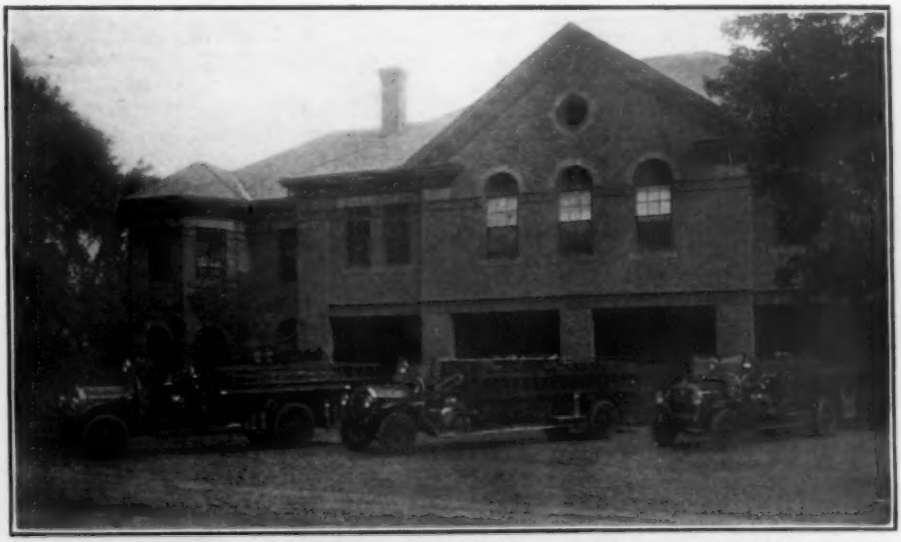
A 3½-TON KELLY-SPRINGFIELD TRACTOR EQUIPPED WITH SNOW-PLOW, OWNED AND OPERATED BY THE SOUTH PARK COMMISSION, CHICAGO

THE CITY OF LEBANON, N. H., USES THIS 3½-TON FEDERAL FOR HAULING MATERIALS FOR STREET MAINTENANCE. THE TRUCK IS HERE SHOWN AT THE SAND-PITS OUTSIDE THE CITY



MOTOR FIRE APPARATUS OF THE KANSAS CITY, KANS., DEPARTMENT

TWO WHITE CHEMICAL TRUCKS THAT ARE QUICKLY ON THE JUMP AT THE FIRST TAP OF THE GONG, DURHAM, N. C.



MAXIM FIRE TRUCKS EQUIPPED WITH SEWELL CUSHION WHEELS, IN USE AT ONE OF THE STATIONS OF THE WATERTOWN, MASS., FIRE DEPARTMENT

Tentative Suggestions for the Standardization of Governmental Charts

By Rowan Whealdon and Robert D. Leigh
Reed College, Portland, Ore

WHAT the map is to geography, the chart should be to government. The governmental chart should be a graphic representation of the scheme of a government, showing clearly the nature of the governmental departments and their relationships to one another.

There are three governmental relationships: origin, removal and function. By origin is meant the source from which an officer or a body receives its position. It may be from the people by election, or it may be from a superior body or officer by appointment.

The removing authority is also of universal significance. Surely in most cases it is destructive of the most successful administration to have a government unit responsible to one source for placement and to another for displacement. When the powers of placement and displacement come from the same source, the relationship is doubly important.

The third fundamental relationship is that of function. One officer or body may be connected with another by having no more than advisory power. Or, again, the connection may be closer, such as a supervisory or a veto right. There are still other primary relationships which affect the people; for example, the legislature with its private law-making powers.

The usual governmental charts are unsatisfactory. They do not contribute as much as they might toward the representation of the scheme of government. Most of them are masses of boxes, circles and lines without much system or completeness. In some cases a line means an originating relationship, in others a functional connection. Usually the primary functions are not disclosed at all except by general inference from the name of the unit, and power of removal is almost always unnoted. Inconsistency is, however, the worst feature. To have a line mean one sort of relationship on one chart and another on another is bad enough, but such inconsistency appears, at times, on the same chart.

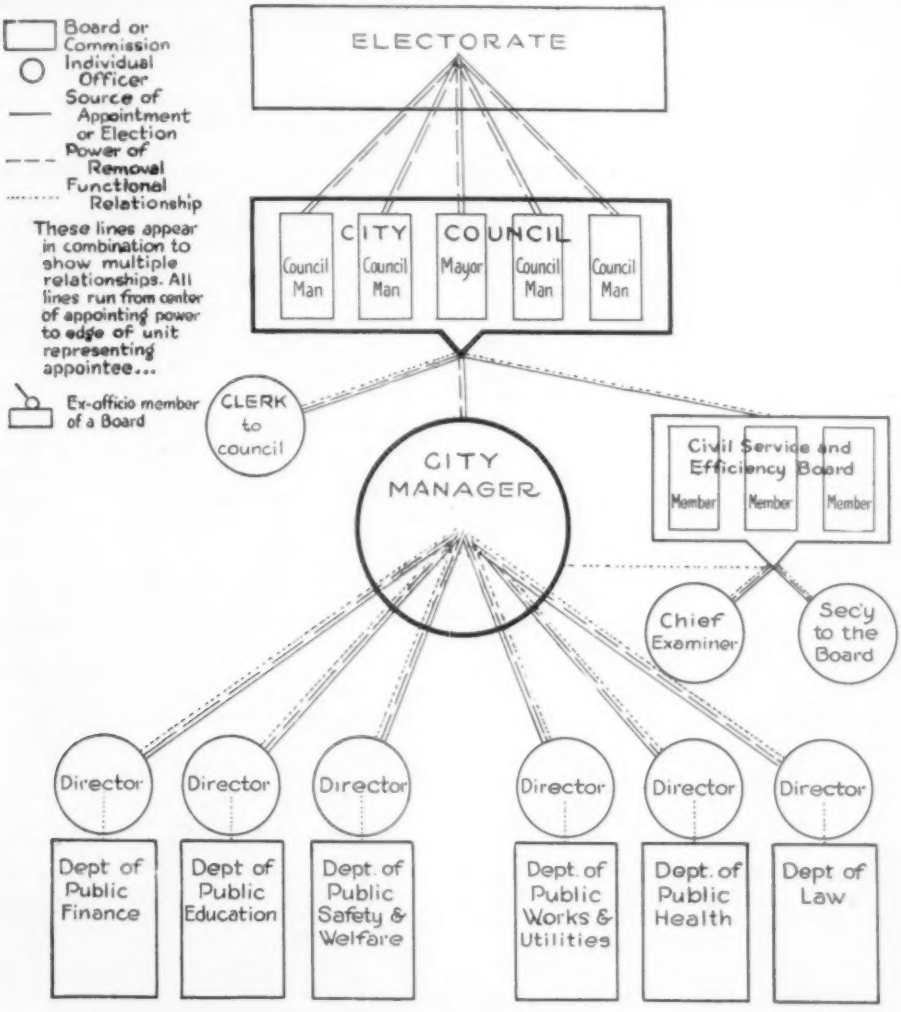
Map-making has definite system. North has a definite position at the top of the page. Relief maps, contour maps, and political maps all have their technique. Why not give the governmental chart a technique? Of course it can never be so definite as in the making of maps to exact scale, but certainly there is room for valuable systematization.

Intelligent Choice of Devices

There is a basic rule in chart-making which should never suffer exception. A *government unit should be represented by a graphic unit.* Any officer or body which acts as a separate division of the government should be so indicated. When the governmental unit consists of a single officer distinctly apart from all others, it may be represented on the chart by a circle, leaving the rectangle for boards, commissions, committees and other multiple units. Units which have important and special powers when acting in conjunction with other units as a larger unit, should appear on the chart as part of the larger group.

Since lines most frequently indicate relationships, a definite system should be used. A single unbroken line might represent originating relationship; a broken line of dashes, removal; and a dotted line, functional connection. With this as a basis, when two or more of the three relationships exist between two bodies, combinations can easily be made. Lines should be drawn from the middle of the unit from which they emanate to the circumference of the unit to which they proceed. This avoids possibility of misunderstanding as to which unit is the appointer and which the appointee.

One peculiar relationship exists in governmental practice which must be classed as functional. An appointing officer, such as state governor, is frequently ex-officio member of a number of the units which he appoints. This may be indicated graphically by a diminutive reproduction of the appointing officer's graphic unit at the circumference of the unit representing the appointed board.



GRAPHIC PRESENTATION OF THE CITY MANAGER PLAN, USING THE SUGGESTED STANDARD SYMBOLS

A legend should be attached to the chart showing just what each device means. At first this would be especially necessary; but if any simple plan were consistently adhered to, it would soon come to have meaning as definite as any of our common symbols.

It is not wise to attempt by graphic means to put more than three fundamental relationships on a chart. If it is desirable to show whether the originating power means election or appointment, it should be covered by a footnote. So, also, where the functional connection line shows working relationship there may be a footnote to tell whether the relationship is advisory, supervisory or of another sort.

These devices have covered only the interrelationships between governmental units. The primary functional relationships, such as that of the legislature in making laws, of the courts in judicial interpretation, are in almost all cases indicated by the name of the unit. So also the name of the unit usually gives a definite clue as to the nature of its internal organization. This,

however, can well be made plainer by the form of the bounding lines of the graphic unit. If the department is loosely organized, it is suggestive to have the bounding lines fine or broken; if the reverse, they can be made heavy, indicating the organic unity. The size of the graphic unit should not depend so much on the numerical size of the department represented as upon its governmental importance. A single officer is frequently made more important than a large board; hence it would be unreasonable to give the unimportant board graphic predominance. Here, again, only the larger facts can be shown on the face of the chart. Explanation and reference must give such details as are desired.

Position is another resource which can be utilized. One part of the graphic field is no better suited than another for representation, yet upon general arrangement depends the success of the chart. The chart should start with the electorate, the fact being kept in mind constantly that the final expression of the functions of the units is for the same electorate. Footnotes are to be preferred to written-in explanations. They obviate the danger of cluttering up the chart, invariably destroying its graphic effectiveness. No chart can cover much ground without some such help.

These suggestions are intended to make the chart a more usable aid to the study and explanation of government. If they serve to complicate rather than simplify chart-making they fail in their purpose. Many devices might be used making it possible to show innumerable facts on the face of the chart. For example, by means of squares, triangles and other graphic symbols, it would be easily possible to represent every type of department or official. By means of colors, dots, and dashes and their combination, every sort of relationship could have graphic representation. But the result would not be easily intelligible; it would be hieroglyphic rather than graphic. Only such devices as help rather than hinder the easy interpretation of government are desirable on a chart. These suggestions are, moreover, designed only for general governmental charts intended to give a clear conception of the organizations of such units of government as the city, county, state or nation. Special-purpose charts indicating some single features would probably alter these rules and create a technique to fit their special cases.

On the Calendar of Conventions

April 12-17.—Atlanta, Ga.
National Organization for Public Health Nursing. Biennial convention. Executive Secretary, Ella Phillips Crandall, 156 Fifth Avenue, New York City.

April 13-17.—New Orleans, La.
National Probation Association. Annual conference. Secretary, Charles L. Chute, 58 North Pearl Street, Albany, N. Y.

April 19-21.—Cincinnati, Ohio.
National Conference on City Planning. Annual conference. Secretary, Flavel Shurtleff, 60 State Street, Boston, Mass.

April 27-29.—Atlantic City, N. J.
Chamber of Commerce of the United States of America. Annual meeting. General Secretary, Elliot H. Goodwin, Riggs Building, Washington, D. C.

May 4-6.—Chicago, Ill.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 87 Milk Street, Boston, Mass.

May 5-7.—Washington, D. C.
American Institute of Architects. Annual convention. Executive Secretary, E. C. Kemper, The Octagon, Washington, D. C.

May 7-8.—Philadelphia, Pa.
American Academy of Political and Social Science. Annual meeting. Secretary, J. P. Lichtenberger, Logan Hall, West Philadelphia, Pa.

May 10-11.—St. Louis, Mo.
American Association of Engineers. Annual convention. Secretary, C. E. Drayer, 63 East Adams Street, Chicago, Ill.

May 13-15.—Dallas, Tex.
League of Texas Municipalities. Annual convention. Secretary, Frank M. Stewart, University of Texas, Austin, Tex.

May 18-22.—Pasadena, Calif.
National Electric Light Association. Annual convention. Acting Secretary, S. A. Sewall, 29 West Thirty-ninth Street, New York City.

May 19-21.—New York City.
American Federation of Arts. Annual convention. Secretary, Miss Leila Mechlin, 1741 New York Avenue, Washington, D. C.

May 19-21.—Atlanta, Ga.
Tri-State Water and Light Association of the Carolinas and Georgia. Annual convention. Secretary, W. F. Stieglitz, Columbia, S. C.

June 7-10.—Detroit, Mich.
International Association of Chiefs of Police. Annual convention. Secretary, James L. Beavers, Chief of Police, Atlanta, Ga.

June 16-23.—Des Moines, Ia.
General Federation of Women's Clubs. Biennial convention. Corresponding Secretary, Mrs. Mary I. Wood, Portsmouth, N. H.

June 21-25.—Atlantic City, N. J.
International Association of Rotary Clubs. Annual convention. Secretary, Chesley R. Perry, 910 South Michigan Avenue, Chicago, Ill.

June 22-24.—Montreal, Que.
American Water Works Association. Annual convention. Secretary, J. M. Diven, 153 West Seventy-first Street, New York City.

News and Ideas for Commercial and Civic Organizations

Community House Built to Further Americanization Work

SARATOGA SPRINGS, N. Y.—Saratoga Springs has provided a community house for its foreign residents in which every opportunity is to be given them to learn English and gain a knowledge of American life and ideas. This was accomplished thru the efforts of a committee representing the Chamber of Commerce, the Community Association, the College Women's Club, the Mothers' Club, and the Giovanni Italia Lodge of Young Italy, working in coöperation with M. M. Dodge, who is in charge of Americanization work for the State Department of Education in this district; the Committee on Buildings of the Board of Education; and the Superintendent of Schools.

The conclusions reached by the committee, as stated in the report on the subject presented to the Board of Education by Charles L. Mosher, the Superintendent of Schools, were that a deep interest on the part of the foreign population itself was essential to successful Americanization work and that the evening school held in the high school building would not serve the purpose adequately, but that a small two-story brick building standing on No. 1 School property and used as a shop would, when renovated and properly equipped, serve effectively as a center for this work, because a large majority of the foreign-speaking population live near that school. The committee therefore petitioned the Board of Education in the names of their respective societies to assign this shop building to the work of Americanization and related efforts.

When the Board of Education first looked over the building to see whether it would do, there was everything imaginable stored within its walls. Its possibilities were easily recognized, however. To-day it is a community house and is as clean, cosy and attractive as the hands of carpenters and painters can make it. Since the building was originally erected for use as a workshop for the school carpenter, it is a substantial structure, with one room on the first floor and a corresponding one on the second. The two rooms are finished with beaver board in panel effect, and the whole is murescoed in buff color. About $1,500 has been expended in the improvements, one-half of which was raised among the societies interested in the movement, the balance having been provided by the Board of Education. In order to cut down the expense, the boys of No. 1 School did the painting and murescoing under the direction of the manual training instructor.

With the coöperation of the State Department of Education, a trained director, Miss Elsie Swartwout, of Auburn, N. Y., has been secured and is now in charge, arranging the work.

An institute for neighborhood workers has also been inaugurated and the first two lectures have been given. The institute is being conducted in a public hall. In fact, it is the intention to develop this local neighborhood house movement to the highest possible degree of efficiency and demonstrate the possibilities of this line of work.

J. E. CANFIELD,
Executive Secretary, Saratoga Springs Chamber of Commerce.

"Little Journeys" by Local Merchants to Manufacturing Plants

LAWRENCE, MASS.—A plan that is being put into operation by the Lawrence Chamber of Commerce and which may be of interest to other secretaries is a series of "little journeys," or educational tours, that are being made by local merchants to the manufacturing establishments in the community.

The first of these tours occurred on October 29, and was made by the furniture dealers' unit to the mills of the Patchogue-Plymouth Corporation, a rug-manufacturing plant. The unit inspected the entire

Otterson Auto-Eductor Cleans Catch Basins

Saves Time-Money-Labor

The Otterson Auto-Eductors are saving thousands of dollars yearly to the following cities now using them:—

Seattle, Wash., 1 machine
Portland, Ore., 1 machine
San Francisco, Cal., 1 machine
Chicago, Ill., 1 machine
Chicago, Ill., repeat order, 6 machines
Chicago Park Board, 1 machine
Milwaukee, Wis., 2 machines
Milwaukee, Wis., repeat order, 2 machines
Indianapolis, Ind., 1 machine
Indianapolis, Ind., repeat order, 1 machine
Louisville, Ky., 1 machine
Louisville, Ky., repeat order, 1 machine
Akron, Ohio, 1 machine
Albany, N. Y., 1 machine
Brooklyn, N. Y., 1 machine
New Bedford, Mass., 1 machine
Providence, R. I., 1 machine
Providence, R. I., repeat order, 1 machine
Richmond, Va., 1 machine
Bridgeport, Conn., 1 machine
Halifax, N. S., 1 machine

U. S. Army Camps:

Camp Meade
Camp Gordon
Camp Lee
Honolulu, H. I.

Efficient, economical and sanitary in operation. Cleans catch basins in from four to twenty minutes:

Equipment mounted on any 5-TON Chassis of suitable standard make.

THE OTTERSON AUTO-EDUCTOR CO.

817 FAIRBANKS BLDG. **SPRINGFIELD, OHIO.**

plant and watched with much interest the different steps from the time the raw material was taken into the mill until it was sent out in the finished product. The trip started in the stock-room, with its vast quantity of various-colored stock, and then, in order, were visited the cutting-room, where the material is cut and reeled for spinning; the spinning-room with its large spinning frames; and the warp dressing department, where are located the largest warping frames in the country. A very interesting part of the work is the weaving, with looms weaving rugs from 27 inches to 4 yards wide. An inspection of the company's modern power plant concluded the very enjoyable visit.

The second of the "little journeys" occurred during the forenoon of November 6, and was made by the clothing dealers to the Arlington mills, which manufacture worsted goods. Every moment of the time was devoted to a careful study of the different processes thru which the wool passes, explained to them by an expert. The workings of a modern plant of this character were a revelation to the members. The merchants were much pleased with their visit to the Arlington mills and are planning other trips there in the near future.

The third tour was made by the grocers and provision dealers to the plant of the Morin Steam Bakery, where they witnessed the process of bread-making. Step by step the dealers followed the different processes from the assembling of the raw materials until the finished golden brown loaves wrapped in wax paper were ready for distribution. The dealers showed much interest in watching the different machines employed, particularly the mixing machines, which eliminate the drudgery of home-made bread-making, and the scaling machine, where the dough is automatically cut into loaves of the desired weight.

The fourth tour was made in January by a group of jewelers to the plant of the Waltham Watch Company.

The Lawrence Chamber of Commerce has had three objects in view in conducting these tours:

1.—The bringing of the merchants engaged in one line of business into closer touch with each other. The Chamber believes that in this way is established a spirit of friendliness and good fellowship, where distrust and suspicion existed before, and that the former means much to the business future of the city.

2.—The practical education of dealers to enable them to get first-hand information on just how an article is made, what it is good for, and why.

3.—The bringing of the manufacturers and merchants together in order to create an interest in the output of the local manufacturing plants.

The plan has been very successful, and the different groups for which the tours have been conducted have expressed themselves quite enthusiastically regarding them.

F. B. WHEELER,
Retail Trade Secretary, Lawrence Chamber of Commerce.

San Antonio Housewives in League to Bring Down Cost of Food

SAN ANTONIO, TEX.—The Housewives' Chamber of Commerce of San Antonio, which has been organized to make war upon the present high cost of food, is urging widespread economy and efficiency in buying as one of the ways in which to meet the situation. Other ways in which it is striving to bring down prices are enumerated in a statement issued to the press by the Housewives' Chamber in December, of which the following is an excerpt:

"1. We urged army officials and city officials to allow retail grocers to have army goods at a discount, so that they could sell at army prices. One week later it was announced that retail grocers could secure army goods at ten per cent discount to sell at same prices as the army store.

"2. We successfully opposed the recent campaign of the wholesale grocers to close the army stores in Texas. We did this with the aid of Washington officials.

"3. We have a bona fide membership of 6,000 signed pledges, and more are pledging every day.

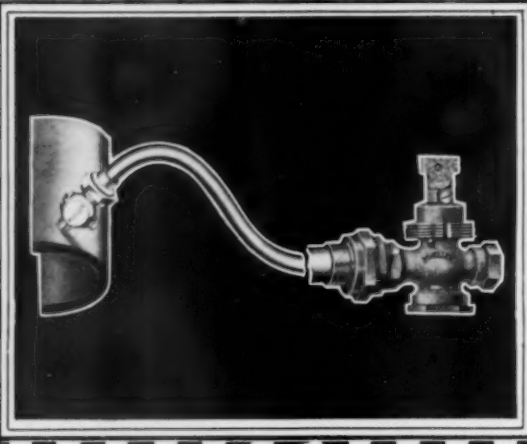
"4. By coöperation of Mr. Saladino, official weights and measures man, we have caused old scales to be replaced with new ones in various stores, and both merchants and customers are more careful as to weights.

Every Ward Organized

"5. We have every ward in the city organized. Each has its ward chairman, who in turn has her precinct chairman, etc. Thus we can thoroly canvass the city for memberships, spread economy propaganda, call ward meetings. Each chairman may, if desired, buy wholesale lots of provisions for her ward.

"6. We are arranging for purchases of wholesale lots, direct from producers.

"7. We have organized departments of milk, meat, fuel, dry goods and clothing, gro-



MUELLER

Goose Necks, Curb Cocks Extension Service Boxes

The three items here shown – MUELLER Goose Neck No. E-500, MUELLER Curb Cock No. E-565, and MUELLER Extension Service Box No. E-751—embody the MUELLER standards of design and precision in manufacture.

Most Water Companies recognize MUELLER leadership—and find that MUELLER equipment reduces operating costs and increases dividends.

Write us for detailed information, prices on these and other items, and proof of MUELLER efficiency.

H. Mueller Mfg. Co., Decatur, Ill.
PHONE BELL 153

Water, Plumbing & Gas Brass Goods & Tools
New York City, 145 W. 30th Street
Phone Watkins 5397
San Francisco, 635 Mission Street
Phone Sutter 3577
Sarnia, Ontario, Canada

Mueller Metals Co., Pt. Huron, Mich., Makers of Red Tip Brass and Copper Rod and Tubing: Forgings and Castings in Brass, Bronze and Aluminum; also Screw Machined Products.

ceries, rents, restaurants, weights and measures, fair price commission, and bulletin board.

"8. We have two large bulletin boards conspicuously placed in the city, and we have three staples constantly on sale at from 10 per cent to 24 per cent below market prices. We continually sell full cream milk at 16 cents per quart, best creamery butter 59 cents per pound, Peaberry coffee 38 cents per pound. In addition, we bulletin all merchants who will sell any article for less than current prices for one week. Home manufacturers have promised to give us a home leader for each week.

"9. Two prominent bakers raised the price of bread one cent per loaf. We protested to the bakers and the Fair Price Board. Thus bread was raised to consumers one cent per loaf for wrapped bread and not at all for unwrapped bread. This price was made a fixed one by the Fair Price Commission. Also our agent sells bread tickets, ten tickets for 80 cents, each ticket good for a one-pound loaf, which means 8 cents per loaf. Price fixed by the Fair Price Commission was 10½ cents per pound wrapped, and 10 cents per pound unwrapped.

Buy Wisely

"10. We continually preach the gospel to women that they have two efficient weapons to use in fighting the high cost of living: one is, 'Buy where goods are cheapest,' in which our bulletin board is an efficient aid; the other is, 'Do not buy at all,' unless absolutely necessary.

"11. The public complain that country produce wagons were required to leave the public square at 7 o'clock in the morning, returning at 3 o'clock in the afternoon. We cooperated with the Mayor in bringing before the public the fact that wagons were allowed to remain until 9 in the morning and could remain as long as necessary in the evening to dispose of their stock.

"12. We have promised to coöperate with city officials in the new market where country produce will be sold all day direct to the consumer.

"13. With the coöperation of the Men's Chamber of Commerce, we secured a milk commission for San Antonio.

"14. We have representation on the Federal Fair Price Commission."

MRS. WILLIAM F. SPRAGUE,
Corresponding Secretary, Housewives' Chamber of Commerce of San Antonio.

$50,000 City Development Fund Raised in One Hour

OKMULGEE, OKLA.—Raising $50,000 in less than one hour was a feat accomplished at the annual banquet of the Okmulgee Chamber of Commerce held on February 5. This amount was subscribed by 134 men out of a total number of 325 in attendance at the banquet. The fund was subscribed on call of the chairman immediately after R. W. Budd, the secretary-manager of the Chamber, had made a report covering the accomplishments of the organization during 1919 and presenting its program for 1920.

The money subscribed will be used to cover the running expenses of the Chamber of Commerce for the current year, and the expense of conducting any special movements for the general betterment of the city or its industrial development. The pledges ranged in amounts from $12.50 to $1,500. There were six subscriptions for $1,500, twelve for $1,000, and a large number for $500 and $250.

CHARLES L. O'NEILL,
Publicity Director, Okmulgee Chamber of Commerce.

Tallahassee Chamber Rules Against Billboards

TALLAHASSEE, FLA.—The Tallahassee Chamber of Commerce has placed the weight of its influence against billboards in the following strong resolution which it adopted about a year ago and the endorsement of which it secured from the City Council:

Whereas, all communities in the state of Florida are seeking to bring new settlers and new industries to their respective counties; and

Whereas, good roads and good scenery along the roads, and neat cities and towns impress tourists in a way that may lead them to elect to locate in such well-kept communities; therefore, be it

Resolved, that the Tallahassee Chamber of Commerce recommend, and does hereby recommend and urge that the city and county officials and property owners in the city of Tallahassee and in Leon County do not permit on their own property, nor on or along the highways, on buildings and fences, or on fields bordering public highways in Leon County the erection and display of any advertising signs, boards, billboards, or other advertising devices, nor allow advertising boards or billboards to be placed on top of buildings within the city of Tallahassee, nor any such placed in the residence section of the city of Tallahassee. Be it further

Resolved, that we also recommend, in the interest of safety to the public, as well as to improve the appearance of the business district of the city, that all business signs for stores or office buildings, garages, etc., be securely fastened flat against such building and not project or extend above the sidewalk beyond the building line. And we urge the members of this organization to coöperate in this matter in every way possible, to keep this city and county free from advertising signs, billboards and similar devices, so as to increase

"You read this for yourselves and then you'll agree with me."

The Southern Goliath

HE was an important business man of Alabama whose power extended far beyond his own city. As president of the School Board he had stood against Automatic Sprinklers for two years to "Keep down expenses."

Suddenly he changed.

Standing before the Annual School Board meeting with a pamphlet in his hand, he said, "this was handed to me by a Boy Scout. That boy was a David, this booklet was the pebble, and," with a good natured smile, "I reckon I'm the Goliath."

"Last July I read about the University fire over in Selma. I happened to be in Birmingham that Saturday night and *saw* Tuggle Institute burn to the ground. A few weeks later I heard details concerning the orphange fire in Huntsville in October—but it took this book sent out by the U. S. Commissioner of Education, to show me why we have these fires so steadily! And the only thing that's going to stop it is installing Automatic Sprinklers."

Several men were on their feet in a second.

"The town can't afford it," one of them shouted.

"Nothing of the kind", shot back the President. "You don't know what's in this book. Every page shows the necessity of protecting the lives of our school children. How would any one of us feel if just one child burned to death in a school fire here?"

He carried the meeting unanimously because he knew conditions and knew the cure. That town equipped the basement and other danger spots of its schools with Grinnell Automatic Sprinkler Systems just as Buffalo, Pittsburgh, Erie, Binghamton, Waterbury and scores of other have.

If you are an official in any orphange, school or hospital, use your influence to have Grinnell Automatic Sprinkler Systems installed. They safeguard human life as nothing else can because they are on duty day and night. Whenever the fire starts—the water starts.

Or if you are just a father or mother, and want to gain a victory over any Goliath that opposes sane protection for the helpless of your city, we will send you a copy of the same book that the U. S. Bureau of Education is distributing. Write today to Grinnell Company, Inc., 283 W. Exchange Street, Providence, R. I.

GRINNELL COMPANY

INCORPORATED

Executive Offices
Providence, R. I.

Complete Engineering and Construction Service on Automatic Sprinklers.
Industrial Piping, Heating and Power Equipments. Fittings, Pipe, Valves.

GRINNELL AUTOMATIC SPRINKLER SYSTEM—*When the fire starts, the water starts.*

property values by preserving the natural beauty of this section.

Several billboards have unfortunately been erected on the country roads near Tallahassee and in the outskirts of the city itself since the adoption of this resolution, but none have been erected in the residential districts. It is believed that the stand taken by the Chamber of Commerce on this important question will have its effect in time, and that property owners will have the courage to refuse permission to place billboards on the public roads.

Motor tourists have complimented Tallahassee's spirit in attempting to suppress the billboard nuisance, and have remarked how much it adds to the charms of the country around Tallahassee to have an open view from nearly every point. The nuisance will undoubtedly be abolished as soon as the public officials awaken to the fact that they have the power to suppress it without losing the votes of certain elements of the population. The Chamber of Commerce realizes that it requires vision, courage and constant effort to make a city of a town, and with the coöperation of the Women's Club of Tallahassee, is endeavoring to make and keep the capital city attractive.

MRS. F. R. S. PHILLIPS,
Former Secretary, Tallahassee Chamber of Commerce.

Waterbury Chamber Organizes Building and Loan Association

WATERBURY, CONN.—A "Build-Now" campaign conducted by the builders and lumber men of Waterbury, which had its headquarters in the Waterbury Chamber of Commerce, brought out the fact that there were hundreds of people in the city who were desirous of owning their own homes but were without the financial means necessary. Under these circumstances the officials of the Chamber saw the need of providing such persons with the facilities for financing building operations and recommended the establishment of a building and loan association.

After thoroly studying the subject, a committee of the Chamber of Commerce recommended a plan of organization, and the Board of Directors authorized the formation of a building and loan association. A group of representive citizens have agreed to act as directors of the association. Its organization will no doubt increase building activity in Waterbury to a considerable degree, and give the man of small means the financial assistance he requires to provide himself with a home.

The Waterbury Chamber has just organized a campaign to instruct the public in the advantages offered by the Building and Loan Association to prospective home-owners and investors. It is hoped that this campaign will result in the sale of from 15,000 to 25,000 shares of the Association's stock.

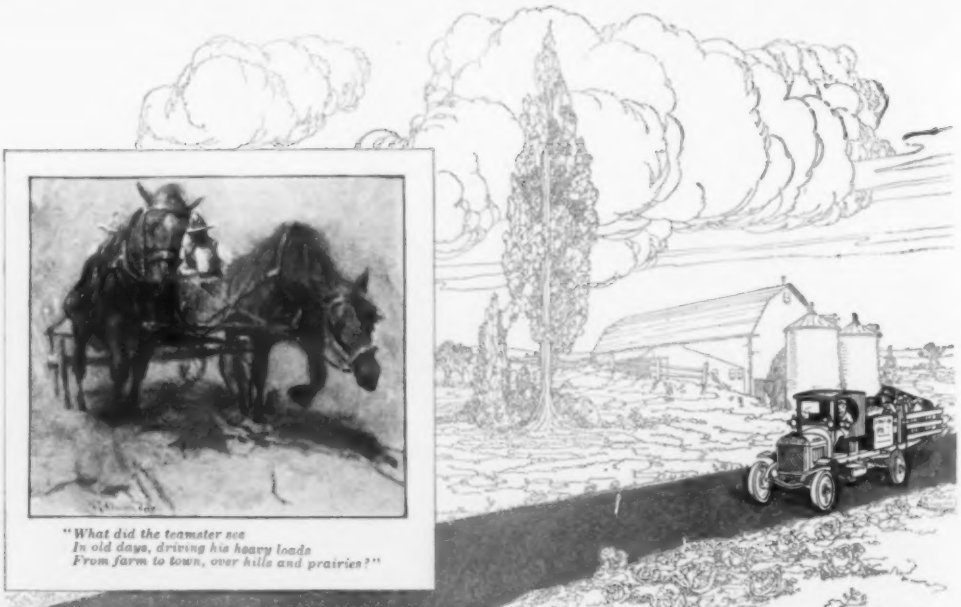
THOMAS F. MOORE,
Assistant Secretary, Waterbury Chamber of Commerce.

Absentee Landlords Block Industrial Development in Kankakee Until Chamber Pays the Hold-up Price

KANKAKEE, ILL.—Kankakee is to have a new factory, a car repair shop that is guaranteed to start as soon as possible and employ at least 500 men. The location of the factory in this city was made certain by the raising of an industrial fund of $16,000 within two days. Of this sum, $12,000 will be used in getting the factory, while the balance of the fund will be retained for other industrial activities. It is of particular significance not only that all the subscriptions were made in two days, but that all except two of the subscribers paid cash and the two exceptions paid within two days following the campaign.

Another fact that should be emphasized is that the $12,000 will not be spent by the city in accordance with the old-style bonus system. The owner of the car repair company decided upon a certain site containing approximately 65 acres. He agreed to pay an average of $650 an acre for the land, but the owners of the three tracts demanded a greater price. As the owners resided outside the city, no pressure could be brought that would induce them to sell for the lesser amount, and the result was that the Chamber of Commerce faced the problem of raising the additional amount of money demanded for the land, or losing the factory.

The officers of the Chamber decided that inasmuch as the factory owner had offered what in their opinion was a fair price, the remainder of the money should be raised locally. The factory owner then agreed to deposit $31,500 in cash as his payment in full for the land, and, further, signed an agreement drawn up by attorneys repre-



"What did the teamster see
In old days, driving his heavy loads
From farm to town, over hills and prairies?"

A Vision of BETTER ROADS

WHAT did the teamster see
In old days, driving his heavy loads
From farm to town, over hills and prairies,
Through mud and flood and storm and washout,
By wood-roads and highroads and the great National Highways from State to State,
His strong horses straining and sweating through dust or mire—
What did that hardy teamster see
On those long, hard roads behind his laboring team?

Across the years he saw a vision,
Prophetic, happy, haunting and inspired—
A Vision of Better Roads in the days that were to be.
He saw broad, smooth highroads running everywhere in a vast network over the country,
Roads without dust or mud or weariness or the constant labor of repair,
Roads pleasant and swift to travel,
Roads clean and safe and paved,
Leading to great cities, friends, business and adventurous, delightful journeys,
All over this broad, beautiful land.
He saw himself and his wife going and returning over these fair highways,
Making trips to town for shopping or pleasure;
He saw his boys and girls going to better schools, and better satisfied with their home;
He saw an end to dreariness and monotony and isolation;
He saw his produce carried quickly to market; anything he needed brought as quickly back to his own door;
He saw happiness, comfort and prosperity in that Vision of Better Roads—
The vision of things which his energy and resourcefulness and courage are today bringing to pass.

IT was "A Vision of Better Roads" that brought forth Tarvia—which has given smooth, dustless, mudless, waterproof highways to thousands of communities all over this vast land.

Tarvia
Preserves Roads
Prevents Dust

If you are interested in good highways, write at once to our nearest office for information regarding good roads that should interest every citizen.

The Barrett Company

New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Cincinnati, Pittsburgh, Detroit, New Orleans, Birmingham, Kansas City, Minneapolis, Dallas, Nashville, Salt Lake City, Seattle, Peoria, Kansas City, Atlanta, Duluth, Milwaukee, Bangor, Washington, Johnstown, Lebanon, Youngstown, Toledo, Columbus, Richmond, Latrobe, Bethlehem, Elizabeth, Buffalo, Baltimore, Syracuse

THE BARRETT COMPANY, LIMITED: Vancouver, St. John, N. B., Montreal, Halifax, N. S., Toronto, Sydney, N. S., Winnipeg

senting the Chamber which obligates him to refund all the money spent by the city in behalf of his factory if he fails to meet every obligation.

Plans for the factory have already been drafted and work is to be started as soon as the weather permits. The coming of 500 additional families will intensify the acuteness of the housing situation, and already a Housing Committee of the Chamber is planning to handle this problem, probably by the organization of a housing corporation.

E. A. WARNER,
Manager, Kankakee Chamber of Commerce.

EDITORIAL NOTE.—Who created the value in the vacant land for which an exorbitant price was asked? The community, not the absentee owner. There is no greater enemy of the chamber of commerce than the land profiteer. There are only two ways of handling him: if a local resident, he may be shamed into accepting a fair price; but, resident or non-resident, he can be curbed if the community cares to adopt a remedy similar to that employed in Pittsburgh and Scranton. See THE AMERICAN CITY, November, 1915, page 412; and November, 1919, page 433.

Disfiguring Poles and Overhead Wires Removed in Harrisburg

HARRISBURG, PA.—One plank in the program of work of the Harrisburg Chamber of Commerce for 1919 called for the removal of the overhead wires and unsightly poles from the business streets of the city. After a long and upright career, the big posts were retired last fall by the Bell Telephone Company (whose division offices are located in Harrisburg), when the American Telephone and Telegraph Company's New York-to-Chicago line was placed beneath the streets of Harrisburg.

The pole line was built in 1891 and carried ninety wires, according to *The Telephone News*, each pole having nine cross-arms. The poles are seventy-five feet high.

THE SAME STREET AFTER THE UNSIGHTLY POLES HAD BEEN TAKEN DOWN

A few years ago one had to be replaced, and six giant chestnut trees were sacrificed before one was secured that did not break in falling. Forty of the ninety wires were those of the American Telephone and Telegraph Company. It was necessary to lay 12,019 feet of terra cotta ducts from the central office in Harrisburgh to Penbrook, a few miles away, to accommodate the new underground cable.

REED McCARTY,
Assistant Secretary, Harrisburg Chamber of Commerce.

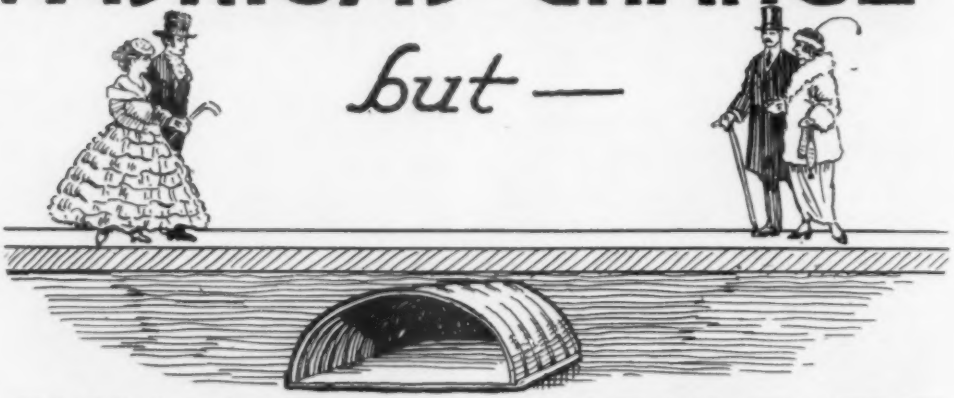
THIS IS THE WAY WALNUT STREET, IN HARRISBURG, PA., LOOKED BEFORE THE POLES WERE REMOVED

Getting Bulletins Read

BRIDGEPORT, CONN.—The object in publishing bulletins of chamber of commerce affairs is obviously to furnish information to the members in regard to the organization's activities and to spur them to greater activity; in other words, the bulletins are printed to be read. In the Bridgeport Chamber's weekly bulletin, *Bridgeport Progress*, of January 10 are a few paragraphs that contain suggestions of possible value to other organizations desirous of arousing

FASHIONS CHANGE

but —



CULVERTS SHOULD BE PERMANENT

FASHIONS and styles have changed many, many times since the first Newport Culvert was laid.

Newport Culverts are good for a long period of years. There is no particular pleasure in ripping up your roads every few years to replace defective culverts. Next time buy Newport Culverts and save all this unnecessary work, annoyance and expense.

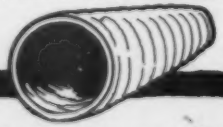
Made from genuine open hearth iron. Government tests prove them 99.875% pure iron copper alloy. Absolutely rust-resisting. Their lasting qualities are an assured fact. Serviceable for every service. The half-round culvert is ideal for city service. Used by municipalities all over the country.

Send us your address and we will tell you how better culverts mean better roads.

NEWPORT CULVERT CO.

542 WEST 10th STREET

NEWPORT KENTUCKY



When writing to Advertisers please mention THE AMERICAN CITY.

a more lively interest in their house organs. The article is reproduced herewith:

File in Your Pocket

You can increase the circulation of this bulletin by filing it in your pocket.

If you have the habit of "carefully preserving" all your mail it may seem a bit careless to suggest this informal method of filing.

We have a fear that what is filed is "filed but not read." We have a hope that what is written on these four pages may be read—"if it is handy."

So—put it in your pocket. Read it at lunch—on your way home—while you are waiting for dinner.

And—when you finish, pass it to Mrs. Active Member, or to any friend you meet. It is written to spread.

In the First Person

It may not be orthodox to use the first person in speaking "thru these columns," but for the sake of simplicity and directness we shall frequently use that form of address.

So that there may be no misapprehension as to the antecedent of "we," let us say that it is your Board of Directors. You have elected them to act for you in directing the activities of your organization and they are not only responsible parties, they are "the responsible parties."

A kick in time saves nine, so fellow members are invited to kick at the source—offers of service find welcome at the same stand.

Ten Minutes per Week

The average man reads at the rate of 250 words per minute. He can read this issue of *Progress* in ten minutes.

Ten minutes per week will review the work of the current week, will present the calendar of events for the coming week, and will give in tabloid form some phase of the city's condition or activities which it is believed may not be known generally or accurately.

A ten-minute audit of organization affairs is bound to put committees "on their toes."

SEWARD B. PRICE,
Secretary, Bridgeport Chamber of Commerce.

Greenfield Housing Plan Prevents Speculative Trading

GREENFIELD, MASS.—Last fall the Greenfield Board of Trade was reorganized into the present Chamber of Commerce, and the first thing the new organization set out to accomplish was to relieve the housing shortage. The situation had become very acute in Greenfield, and many doubted the Chamber's ability to do anything with such a big problem. To these "Doubting Thomases," however, the Chamber lent a deaf ear. A Committee on Housing was appointed, which, after making a careful study of other housing schemes, especially the Bridgeport plan, prepared and submitted a comprehensive report containing recommendations for the formation of the Greenfield Homes Corporation, to be capitalized at $250,000. A prospectus giving the thirteen objects of the proposed corporation was also issued.

Early in January, 1920, the committee's report was accepted by the Board of Directors of the Chamber of Commerce. At a meeting of manufacturers and merchants called soon thereafter, the report and prospectus were read and the form of corporation briefly explained. Subscriptions were asked for at this meeting, and inside of twenty minutes $103,400 had been pledged; $75,000 more has since been promised, and the entire issue of a quarter of a million dollars will be in hand before the first house is built early this spring. The Greenfield Homes Corporation was organized forthwith, and a capable paid manager appointed.

The plan is to build as many homes thru local contractors as possible, not only to secure their support of the movement, but in order that the building material may be purchased in large quantities at wholesale prices. One medium-sized tract of land has already been purchased, and this is being laid out along advanced garden suburb lines by John Nolen, of Cambridge, Mass. It includes tennis courts, a small playground and a wading pool for children. Another tract will be bought soon. At least one hundred houses are to be erected on these two tracts during the coming summer.

Attention is called to two important provisions in the prospectus, the seventh and the twelfth, which were also included in the certificate of incorporation. The seventh provision reads:

"To prevent speculative sale or trading of houses on the part of purchasers owning only a small equity in their property by taking back an option on houses sold on easy terms, to remain in force one year or until 20 per cent of the purchase price is paid."

The promoters want wage-earners to buy the houses and live in them, and it is believed that this provision will prevent speculators from getting hold of the property and depriving the very individuals for whom the houses are being built from occupying them.

The twelfth provision reads:

"To give the refusal to any industry sub-

Copyright 1920, by The Goodyear Tire & Rubber Co.

Making Quick Get-Aways on Goodyear Pneumatics

THIS letter was written seven months after the tires were applied on two trucks. "Our Goodyear Cord Tires still contain the original air. They are the most perfect non-skid tire—it has been unnecessary for us to use any non-skid devices whatever. We find from experience that this tire gives a maximum of resiliency, so essential in making those quick get-aways which every Fire Department must make."—Chief, Texarkana, Texas, Fire Department

On fire trucks the full advantages of Goodyear Cord Tires are noticed on practically every run, in the cushioning and in the traction.

As noted in the Texarkana letter above, the sharp blocks of the All-Weather tread cling fast to the road and curves, making runs less dangerous, more sure.

The remarkable resiliency of the big Cords saves the truck and its crew from the smashing and rebounds of crossings, ruts and bumps.

These tires satisfy, too, because of their tough resistance to cuts and wear; their powerful construction protects our good name.

Generally, fire trucks using Goodyear Cords make greater speed with safety, they arrive at the fire more quickly, than when on solid tires.

Records of many sets of Goodyear Cord Tires on fire trucks, everywhere, can be obtained by writing to The Goodyear Tire & Rubber Company, at Akron, Ohio.

GOODYEAR
CORD TIRES

scribing to a large amount of the stock of the Corporation on a number of houses up to the point where the amount of the second mortgages carried by the Corporation will equal the amount of their stock subscription."

This provision protects the manufacturer who owns a large block of the stock of the Corporation and who wishes to provide housing accommodations for his employes. It assures him a certain number of houses and makes it possible for him to do quite as much for his employes as if he were building the houses himself.

BENJAMIN H. BONNAR,
Manager, Greenfield Chamber of Commerce.

The Cheyenne Plan of Housing

CHEYENNE, WYO.—The Cheyenne plan was first conceived by the Industrial Club (recently reorganized and now known as the Cheyenne Chamber of Commerce) in 1917, but the war curtailed building operations to such an extent that it was not carried out until early in 1919, when work on the project was resumed. A home-building fund of $100,000 was raised among the leading business men, who subscribed to it with a sincere desire to supply homes for those who needed them rather than from a mercenary motive. As soon as this sum had been raised, the Cheyenne Home Builders' Association was formed with seven directors, and incorporated for $250,000. One of the directors was an editor, another an architect, another a wholesale merchant, and the other four were capitalists and bankers. The officers donated their services, and the lawyers did all their work free. The local newspapers furthered the project by publishing free of charge the notice of incorporation and extensive publicity articles.

The first thing the Home-Builders' Association did was to secure options upon vacant city property before any one was aware of its plans, and then bought a number of the lots at a low price. The object was to build bungalows on these lots at the lowest possible figure and sell them at cost. Bids were secured from builders who agreed to build the houses in quantity and order their material in car-load lots.

Twenty-seven houses were built at that time; one contractor built twenty-four and another three. They sold for from $3,600 to $4,500. The profit in no case exceeded $100. The receipts from the sales and any small profits that were realized were turned back to the directors of the Home-Builders' Association to be reinvested in more houses and lots. The bungalows were sold on easy payments of $500 down and $40 per month on the "Pay-as-you-rent" basis, the purchaser paying the taxes and the water and insurance rates. Cash in full was paid in some instances. Every house was sold long before it was completed, and some families moved in before the houses were finished.

The bungalows are one-story, five-room structures. They are heated by furnaces and lighted by electricity, and have all the street improvements, such as sewers, sidewalks and curbing.

The work will be carried on in 1920 on a larger scale and until the need is no longer urgent, the present plan being to construct immediately one hundred houses. The value of the houses constructed last year has increased so much that the banks will readily give loans to carry on the work indefinitely. When the need for houses has been fully met, the original subscription of every subscriber will be returned to him.

FRANK J. WIFFLER,
Secretary, Cheyenne Industrial Club.

Experts in Hospital and Institutional Planning and Operation Furnished

It may be of interest to the readers of THE AMERICAN CITY to know that the Hospital and Institutional Bureau of Consultation, located in New York City and conducted under the directorship of Henry C. Wright, has made available to those desiring it advice regarding every phase of hospital and institutional plan, equipment, organization and operation. To quote from the prospectus:

"It is difficult for one person to give competent and wise advice on each department of a large hospital or institution. In planning, frequently aid is sought from firms that sell equipment. Such firms may yield to the natural temptation of advising too much equipment and space necessitated by it. The best advice comes only from disinterested specialists. Even the advice of these disinterested specialists needs adjusting to bring about a proper correlation between departments. Each specialist in his enthusiasm is inclined to feel that his department is the most important and requires abundant room.

"The Bureau brings together and harmonizes the advice of various specialists so that

Contractors are quick to appreciate the value of improved equipment.

The great resiliency of the Kelly-Springfield Caterpillar tire, its surefootedness under all conditions and its consistent mileage performances have made its economies so evident that leading contractors all over the country are adopting it, many using Caterpillars as exclusive equipment on their trucks.

Caterpillars save truck depreciation, decrease repair costs, cut down gasoline and oil consumption and give amazing traction.

They will both increase the efficiency of your trucks and enable them to operate more economically.

Kelly-Springfield Tire Co.
New York, N. Y.

KELLY SPRINGFIELD TRUCK TIRES

the institution as a whole will be properly balanced and proportioned to the task that it is to perform, and to the budget available.

"Some of the most competent men and women on the various departments and types of hospitals and institutions available in the United States have consented to act as consultants. Not one but has a national reputation. In all cases these men and women now occupy professional or administrative positions. The names of all the consultants to be used in connection with any proposed project will be given upon application. Problems of fiscal control, organization and administration will be in personal charge of the Director."

The office of the Bureau is located at 289 Fourth Avenue, New York. Copies of the prospectus, in which the organization, methods and procedure of the Bureau are outlined in some detail, will be cheerfully supplied to those requesting them.

Who Needs a Job?

By Marcel S. Keene

Lieutenant-Colonel, U. S. A., Retired; Director, Bureau for Employment of Ex-Service Men, New York City

THE reëmployment question, in so far as it affects one-time service men, was so serious during the months of January and February that the various civic and commercial organizations in New York City were asked to take a job census for the purpose of opening up positions of various kinds for men who had worn the uniform. The census was taken, and opened up a few hundred jobs, but not so many as were hoped for. Consequently, the Bureau for Employment of Ex-Service Men is again appealing to employers of labor to send notices of vacant positions to its headquarters at No. 129 Worth Street (telephone Franklin 2283).

The statement that the job situation is serious nearly always provokes an argument whenever the writer makes it to the average high-type business director. "Why, I thought there was a shortage of labor," he replies. "I have been waiting days on a little painting job I want done," or, he has been waiting for printing or plumbing work, and the excuse given to him is "We can't get the men." But the master plumber or painter is telling the truth. There is a glut of men, and there is a scarcity of men. The explanation is found in the *types* of men concerned. Any expert mechanic can have any one of a dozen jobs that are open, but the unskilled man (not of the pick and shovel variety) who wore the uniform is having a terribly hard time to get placed.

About four hundred such men apply for work at the Bureau each week. Before the war they were parcel-wrappers in department stores; checking-clerks on freight piers or in warehouses; white goods salesmen in small stores; doormen; taxicab starters; general filers and clerks. In short, they were engaged in occupations requiring but little education or technical knowledge. As they were twenty-one or over, they were called in the draft, and their positions were filled either by girls or by youths between sixteen and twenty.

When these men went to war they were for the most part pale and anemic and content with anything that gave them board and lodging. A job was a job, and its nature mattered very little. When these men came back, they had been built into strong men physically. Out-of-doors and army or navy drill and regular habits of life had made them over. Everything mattered to them a great deal. They had the natural ambition which comes with a healthy outlook on life and they had learned the responsibility of citizenship under the weight of a musket and on board ships or in the trenches. So the new wine came back to be put in the old bottles!

The average man was confronted with one of several situations when he entered civil life again. He got his old job back with an increase in pay corresponding to the ever-rising cost of living. But this man is not among the 400 new faces who fill the Bureau each week. The man who comes here got his old job back at the old pay prevailing in 1917 and couldn't live on it; or, he got another job offered him under the woman or youth who succeeded him in 1917; or he was turned away point

What are the Essentials
of a Correctly-Designed Pavement?

THE years have proved the following to be the fundamental features of a correctly-designed pavement.

1. It must have a strong supporting foundation.
2. This foundation must be protected from the destructive action of traffic by a resilient wearing course which can be economically maintained in perfect condition.

The supporting foundation may be built in various ways of various materials, the primary requisite being sufficient mass and strength to support the traffic load.

The secret of long-wearing roads is resiliency—the resiliency of the finest asphalt—the resiliency which comes back like live rubber under the impact of heavy traffic.

We are prepared to undertake contracts for immediate or yearly requirements for Sinclair Asphalt for all types of asphalt pavements.

Your inquiries will receive prompt attention.

SINCLAIR REFINING COMPANY
The Asphalt Sales Department, Chicago

SINCLAIR ASPHALT
The Asphalt of 100% Vitality

blank when he returned, with the statement that there was nothing for him. Then there is still another type of youth—the one who, when taken in the draft, was not overly ambitious, but in whom ambition has been instilled with his healthier body and healthier outlook. This type of man had no definite connections before the war,—perhaps he wasn't old enough to have made them,—so he is "up against it" now.

There is another type of man who comes to the Bureau with whom I sympathize deeply. He is the married man who had to take the first thing that came along when he got out of the army, in order to earn meat and bread. Of course, the story of the Canadian major who faced that predicament is famous. He was found in Brooklyn washing windows for a living. Now he is an executive in a Chicago bank. Included in this category are many men of unusual executive ability. During the war they handled large bodies of men successfully; they administered undertakings which make ordinary peace-time jobs look minute beside them; yet they are forced by circumstances into the most humble and lowly jobs. It is all right to say that any man who has a job should thank God and be satisfied, but in practice it is different. He may thank God for bread and meat, but he isn't satisfied unless he has the right kind of outlook, something with a future to it; and if he is satisfied, he isn't the right sort of man.

The writer believes that the sooner these men are taken care of, the quicker we shall solve the problems of industrial unrest. The man who has known the severest test of his obligation to citizenship should be the bulwark of safety around our nation. If he confuses ingratitude and selfishness with "capitalists," his mind will become a fertile field for the seeds of the agitator.

The City's Legal Rights and Duties

Monthly Department of Information for City Attorneys and Other Municipal Officers, Summarizing Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

Classifying Cities—Invalid Regulations

Where statutes classify municipalities by population, the basis to be taken is some official enumeration, where the statutes do not otherwise provide. The federal census is usually adopted. Under an act empowering cities having populations of more than 5,000 to levy certain taxes on moving picture theaters, a city having less than that population, according to the last federal census, could not levy such tax, altho an unofficial enumeration made by school superintendents showed a larger population. (North Carolina Supreme Court, State vs. Prevo, 101 Southeastern Reporter, 370.)

Establishment of Street Grades

An owner of a lot abutting upon a street cannot recover from the city for damage caused by reducing the street to the grade first established by the city. But the city cannot delegate to a committee, official or any one, its statutory power to fix a street grade. The council may delegate all ministerial power, such as surveying, investigation, and computation, and may take the advice of attorneys, engineers, and others, but the final determination as to what grade shall be established must be by the council itself. (Colorado Supreme Court, City of Leadville, vs. McDonald, 186 Pacific Reporter, 715.)

No City Control of Interstate Commerce

One operating a motor vehicle for thru-transportation of passengers from a point in Pittsfield, Mass., to a point in Albany, N. Y., doing no local business in the former city, is not subject to a regulation adopted by that municipality, requiring one using an automobile for the transportation of passengers from place to place in the city to obtain a license. Construed otherwise, the regulation would interfere with the exclusive province of Congress to regulate

Get These Free Suggestions on Concrete Improvements

ALPHA CEMENT is manufactured with the greatest of care to insure full binding power and uniformity. The entire manufacturing process is under the strict supervision of chemists and chemical engineers.

Hourly tests are applied, and every bag of ALPHA goes out guaranteed to fully meet standard specifications. Test it, if you like, but you don't have to.

But not much space is given in ALPHA literature to talk about the product. ALPHA literature is "Service Material." Our 96-page illustrated Handbook, ALPHA CEMENT, How to Use It, our magazine ALPHA AIDS and our long series of Service Sheets and Special Bulletins are given up almost entirely to directions about the proper use of cement and how to make permanent and handsome concrete improvements.

Information of the most practical sort is available on the following list of subjects:

- Workingmen's Homes
- Walkways & Driveways
- Concrete Roads
- Bridges and Culverts
- Foundation and Hatchway
- Gutter and Curb
- Storage Cellar
- Small Warehouses
- Spring House
- Small Dam
- Milk House
- Ice House
- Manure Pit
- Septic Tank
- Oil Storage Tank
- Tennis Court
- Inclosure Walls
- Barn and Silo
- Corn Crib
- Storage House
- Smoke House
- Hog House
- Poultry House
- Dipping Vat
- Tanks and Troughs
- Piers for Small Boats
- Garden Furniture
- Greenhouse
- Coal Pocket
- Post and Walls
- Walls, Sills and Lintels
- Garages and Runways
- Overcoating of Old Dwellings
- Porch, Cellar and Stable Floors
- Warm-weather Concreting

Ask for the Sheet or Bulletin that interests you most, also for a copy of the Handbook. All sent free of cost or obligation if you live East of the Mississippi. We are obliged to ask inquirers out of our sales field to send fifty cents to cover the printing and mailing expense of this material.

ALPHA PORTLAND CEMENT CO.

General Offices: **EASTON, PA.**

Branch Offices: New York Boston Philadelphia Pittsburgh Baltimore Savannah

interstate commerce. (Massachusetts Supreme Judicial Court, Commonwealth vs. O'Neil, 124 Northeastern Reporter, 482.)

City Treasurer's Office to the Highest Bidder

Novel provision of the charter of the city of Corpus Christi, Tex., is held by the Texas Court of Civil Appeals to be unconstitutional in so far as susceptible to interpretation as providing for farming out the office of city treasurer. (Mireur vs. City of Corpus Christi, 214 Southwestern Reporter, 528.) The provision includes the following clauses:

"The office of city treasurer shall be *let by contract* to the highest and best bidder, in the discretion of the city council, and in determining the highest and best bidder, the highest rate of interest to be paid upon daily balances and the value of the bond tendered shall be the criterion that shall decide."

The Court takes this rap at the provision:

"The section providing for the selection of a city treasurer probably has no parallel in the city charters of the country, and if, as contended by appellants, such treasurer may be a corporation and purchase the office thru his or its bid for the use of the city money, we have a condition or state of affairs repugnant to purity of government and destructive of the principles upon which officers should be chosen in democratic communities. While there is language in the section quoted indicative of an intention to create an office, we cannot conceive that a legislative body in this country would lend its countenance to selling an office to the highest bidder, as would an auctioneer sell goods and chattels placed in his hands for sale. No such law could be sustained under our Constitution which would authorize or permit the sale or farming out of an office. A statute should be so construed, if possible, as to avoid absurd and unjust consequences, and such construction should be adopted which comports with the general public policy of the state, rather than that which would encourage such policy and destroy its ideals of government."

Municipal Liability for Negligence

The Ohio Supreme Court has reversed itself on a point of law relating to the liability of Ohio cities for injuries committed against third persons by negligence of municipal employes in the course of performing ministerial acts of employment. Overruling its decision in the case of Frederick vs. City of Columbus, 51 Northeastern Reporter, 35, the Court holds in the case of Fowler vs. City of Cleveland, 126 Northeastern Reporter, 72, that if defendant city's motor hose truck was recklessly driven along a street in returning from a fire, the city is liable for resulting death of a pedestrian. In the course of a lengthy opinion on the subject, the Court says:

"It would, of course, be admitted the municipality was under no obligation to provide any fire department, and that the matter of deciding whether it should have a fire department, and, if so, what sort, and the extent of the services that the city would render on the general subject, is governmental. No complaint could be made concerning the exercise of that governmental power. But when it has determined all of these matters, and has placed an instrument upon its streets which, when negligently and carelessly operated, is dangerous to the lives of its citizens, then the operation of this dangerous instrument, while governmental, as being operated by the government for the public welfare, yet is ministerial and proprietary. It is performed by agents who as such have no part in the decision or determination of the sovereign will. Their relation is precisely the same as the agent of a private person. When the functions of government were negative rather than positive, the results of non-liability for any and every act did not attract close attention or inquiry. To adhere to the ancient rule in the presence of existing relations would seem to involve the obvious contradiction that the state, which is formed to protect society, is under no obligation, when acting itself, to protect an individual member of society. Such conceptions of sovereign prerogative are not only illogical, but they offend the spirit of our institutions. We have successfully striven, under a system of checks and balances, to reconcile liberty with authority. Authority should be reconciled with justice."

Advancements to Contractors

The builder of a water system for a city, having been partly paid in advance thru delivery to him of bonds of the municipality, was chargeable, in a suit brought by him to recover a balance due on the contract price, with interest accruing on the bonds during the time that the bonds were outstanding before payment was due. (Oregon Supreme Court, Oregon Engineering & Construction Co. vs. City of West Linn, 185 Pacific Reporter, 750.)

"Majority of Electors"

A statute providing for the acquisition of a public utility, when authorized by a "majority of the electors" of a municipality, did not require concurrence of more than a majority of the qualified electors of the municipality voting at an election on the question. (South Carolina Supreme Court, Harby vs. Jennings, 101 Southeastern Reporter, 649.)

Free Book on Sewer Cleaning

THIS seventy-two page book including dozens of photographs will be sent free of charge to all those interested in sewer cleaning work. The problem of sewer cleaning is one which confronts the people of every city. The Turbine Sewer Cleaning Machine has effectively solved the problem. It makes little difference how severely clogged up a sewer may be—the Turbine will clean and scour it and make it like new. Our work is guaranteed—you take no chances.

Send us your address for our free book on sewer cleaning.

Turbine Sewer-Machine Co.

195 ELEVENTH ST. MILWAUKEE, WIS.

Title to Plant Equipment

A contract under which the seller of machinery to a contractor for installation in a municipal plant reserves title until payment of the purchase price is binding on the city, where the city has actual notice of such reservation of title before actual installation of the machinery. But it may be that mere constructive notice imparted by recording of the contract would not render the contract valid as against the municipality. (Washington Supreme Court, Allis-Chalmers Mfg. Co. vs. City of Ellensburg, 185 Pacific Reporter, 811.)

Charges of Public Service Corporations

Where a gas franchise granted by a city for a term of years provides for a maximum schedule of charges, the grantee gas company will not be permitted by the courts to increase its charges beyond that maximum, on the ground that changed conditions make the contract confiscatory of the company's revenues, unless it appears that, taking the entire franchise period as a whole, the contract will prove unremunerative. Cities have no power to fix rates that may be collected by public service companies, excepting as such power may have been clearly conferred by the state, in which the authority primarily resides. Charter authority in a city to control its streets or to approve the location of pipes, mains, etc., does not empower it to fix such rates, and where a franchise contract purports to exercise such power it will not be upheld as against an increase of rates rendered necessary to give the public utility a fair return in its investment. (United States Circuit Court of Appeals, Sixth Circuit; Knoxville Gas Co. vs. City of Knoxville; 261 Federal Reporter, 283.)

Municipal Home Rule

A decision of the Michigan Supreme Court emphasizes limitations upon home rule powers of municipalities. The conclusions are stated in the recent case of City of Kalamazoo vs. Titus, 175 Northwestern Reporter, 480, wherein the plaintiff city failed to establish power to regulate the rates at which gas might be sold by a local public utility company, after the company's franchise had expired. The salient parts of the opinion are as follows:

"The charter provision, the ordinance, the argument, made for the city, reflect a popular interest in, and, we conceive, a popular misunderstanding about, the subject of home rule, so-called, in cities. There is apparently a widespread notion that lately, some way, cities have become possessed of greatly enlarged powers, the right to exercise which may come from mere assertion of their existence and the purpose to exercise them. Whether these powers are really inherent in the community but their exercise formerly was restrained, or are derived from a new grant of power by the state, or may be properly ascribed to both inherent right and to a new grant, are questions which do not seem to bother very much the advocates of the doctrine that they in any event exist. On the other hand, there is expression of grave doubt whether, in the view of the law, there has been any enlargement or extension of the subjects of municipal legislation and control or of the powers of cities except as those subjects and powers are specifically enumerated and designated in the Constitution itself and in the home-rule act.

"Political experiment has not yet produced in this state the autonomous city—a little state within the state. We have a system of state government, and the right of local self-government is, and always has been, a part of the system. We have, as we have always had, a state Constitution, the fundamental law. By it, now as formerly, the legislative power of the state, and all of it, is reposed for exercise in a Legislature, save only as reserved by referendum and initiative proceedings, which are not here involved. * * *

"We might go further and point out, what is true, that power to regulate rates of public utility companies is not a power necessary to local self-government, denial of which, or interference with the exercise of which by the Legislature, would be interference with local self-control."

The decisive point reached in the opinion is that great authority conferred on a city by the Legislature to provide for the use, regulation and control of streets does not authorize a city to fix compulsory gas rates.

"The gas company derives its right to make and sell gas, not from the city, but from the state," says the Michigan court.

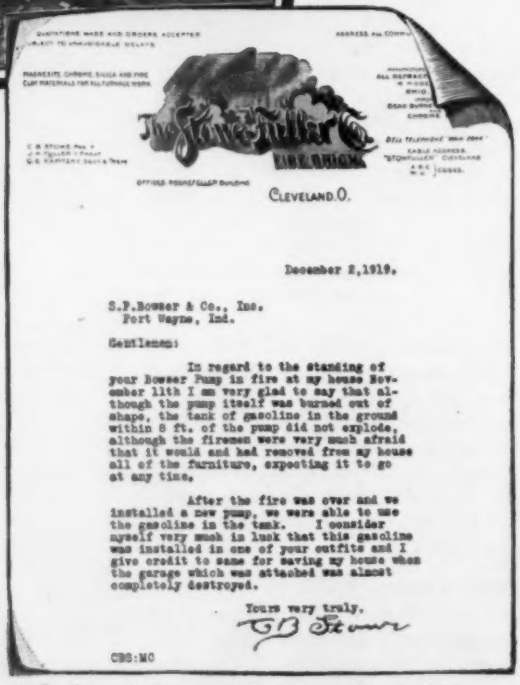
Void Municipal Bonds

Where invalidity of a bond issued to a street improvement contractor by a municipality is apparent on the face of the bond, it is void, not only in his hands, but also in the hands of an innocent third person to whom he may have transferred it. (California District Court of Appeal, Coleman vs. Spring Construction Co., 182 Pacific Reporter, 473.)

THE GASOLINE WAS SAFE IN THE BOWSER Underground Tank!!

View after the fire. Note the condition of the Bowser Pump

The Bowser Fig. 41 Installed in the above garage



CLEVELAND, O.

December 2,1919.

S.F.Bowser & Co., Inc.
Fort Wayne, Ind.

Gentlemen:

In regard to the standing of your Bowser Pump in fire at my house November 11th I am very glad to say that although the pump itself was burned out of shape, the tank of gasoline in the ground within 8 ft. of the pump did not explode, although the firemen were very much afraid that it would and had removed from my house all of the furniture, expecting it to go at any time.

After the fire was over and we installed a new pump, we were able to use the gasoline in the tank. I consider myself very much in luck that this gasoline was installed in one of your outfits and I give credit to same for saving my house when the garage which was attached was almost completely destroyed.

Yours very truly.

CBS:MC

The incident illustrated above is but another example of the fire and explosion proof qualities of Bowser Gasoline Storage Systems.

We will be glad to place at your disposal our corps of engineers in solving your oil and gasoline storage problems. It involves no obligation on your part.

S. F. BOWSER & CO., Inc., Fort Wayne, Ind., U. S. A.

S. F. Bowser Co., Ltd., Toronto, Canada

A New Method of Air Conditioning in School Buildings

The Use of Ozone to Remove Odors and to Revitalize the Air

By E. S. Hallett

AN increasing stress is yearly being placed upon the housing conditions of our public schools as it is realized that the health and comfort of the child must greatly influence his development. Schoolrooms are occupied to their capacity every day, a condition that accentuates every defect that may exist.

More than two years ago, the writer, while making a study of the heating and ventilation of the St. Louis schools, was struck with the enormous waste of heat that passed up the vent stacks of all modern buildings. Seven or eight changes of air per hour were being delivered, all of which was discharged from the building after passing once across the schoolrooms. In the face of all this cost, many teachers complained more or less regularly of the heating system. It was apparent that the most nearly perfect system was not satisfactory to either occupant or operator.

Air conditioning pertains to both the health and the comfort of the individual. The popular mind recognizes only the latter. The health will be affected by the kind of air breathed, while comfort depends largely upon the effect which the air has upon the body surface. It is important to bear this distinction in mind. A bad odor from a harmless chemical starts an alarm of bad air, whereas a deadly vapor without odor is accepted as good ventilation. The well-known test recently made by enclosing several persons in a closed box until the air was oppressive to the subjects, resulted in no improvement in the comfort of the men when breathing pure air thru tubes from the outside. The experiment being reversed so that fresh subjects breathed impure air thru tubes from the inside, resulted in no discomfort.

What is that element or condition of the salt air or mountain valley that is so healing to the invalid and so delightful to all? It is not dryness, it is not lightness due to high altitudes, nor variation in amounts of oxygen or carbon dioxide; it is simply the presence of ozone, or atomic oxygen.

Ozone is a highly active form of oxygen. Its function, whether in revitalizing the air of a school, or in purifying the water of swimming pools, or in the several medical uses, is that of oxidation. Oxidation may be mild and healing, or it may be terrific conflagration. Ozone, on account of its highly active chemical affinity, must be handled with a full realization of its nature. In this respect it is only like many other of the beneficent resources of nature. On account of the great difficulty of making quantitative analysis of ozone in the low concentrations required in ventilation, there has until now been no guidance for its practical use. It is too low to be rated in percentages. The determinations in nature on the so-called ozone days in those places where it is found, is roughly about one part in a million of air. In such places there is no ozone odor. The air simply feels fresh.

Ozone has until recently been produced only by the electric spark of static machines, but when produced by the spark or arc, nitrous oxide and perhaps other nitrogen compounds are produced, which are objectionable in ventilation. The improved apparatus now produces ozone without noise or any moving parts, and at a cost so small as to be negligible. The current required for the ventilation of a 24-room school is about 700 watts.

Ozone is a germ destroyer and leaves no injurious residue. We have sought a means of sterilizing the water of the air washer to prevent the spread of disease. We have sought a means of renovating air ducts to remove age-long smells in old buildings. Ozone accomplishes these results perfectly.

It is noticed that the tendency in recent times is toward the scattering of the heating plant, resulting in added expense and inconvenience, all to avoid the use of horizontal ducts in the system. It has even been proposed to construct the air conduits re-

Make Streets Clean

"Studebaker Model"

FLUSHING and SPRINKLING UNITS

Forty feet from curb to curb—sand filled brick pavement—cleaned in one trip with three nozzles.

The machine has four nozzles which can be used discharging one, two or three flushing streams at the same time.

Removing the heavy accumulation of Winter or the lighter dirt of Summer is within the range of this machine due to the adjustable nozzles and the independent control of the pressure.

A horse-drawn uniform pressure flusher is provided where conditions do not justify investment in a motor flusher but where economical, efficient and sanitary street cleaning is desired.

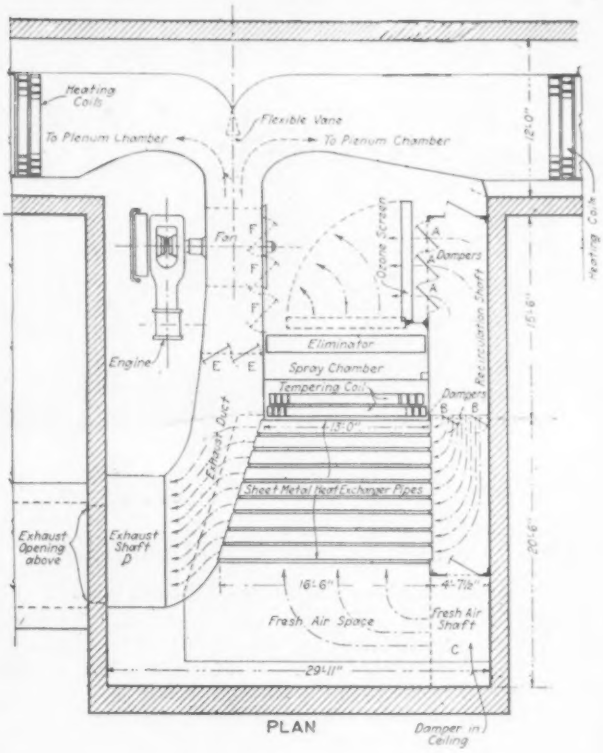
Inquire of any motor truck manufacturer or ask the truck dealer in your city for complete information on "STUDEBAKER MODEL" flushing and sprinkling units mounted on their trucks, or address

Municipal Supply Company

South Bend, Indiana

quired for a heating system so that they may be thoroly washed out. The use of ozone is equivalent to burning them out —rendering them perfectly odorless and sanitary.

Upon making a search of the literature on the practical working of ozone in school-rooms, it was found to be wanting in this country. Quite extensive use has been made, in ventilation other than in schools, in Germany, France, and in the subways of London, and all with highest satisfaction. It was necessary, then, for the writer to carry out tests that would have value, and under such medical supervision as would inspire confidence. Search was also made for ozone apparatus which would produce pure ozone and under such control as would determine proper concentration.

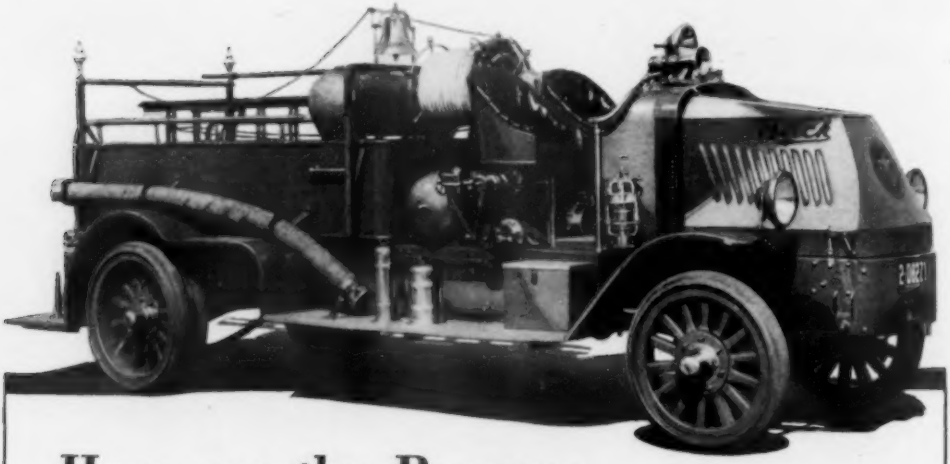


It happened just at this juncture that Dr. Stewart, the head of the hygiene department of the Board of Education, St. Louis, came to the building department with a complaint from one of the down-town schools that the air was so bad in some rooms that certain teachers threatened to resign on the advice of their physicians.

The First Experiment

The school in question was equipped with a plenum heating system with air washer in good order and the full quota of 1,500 cubic feet of air per minute to each room. An examination was made of all conditions, and the ventilating apparatus was found to be perfect in operation, but the children in this district were from families of foreigners who never bathed. It is a fact that many were sewed up for the winter. They ate garlic and such foods, and it was this highly odoriferous condition that was causing the complaint. There was, in addition, a prejudice against the heating system and the department in general, because they were not permitted to open windows in cold weather. The writer proposed to the hygiene department that the ozone experiment be started in this school.

The apparatus was set up in the air passage between the air washer and the fan, and regulated to produce just sufficient ozone to be barely detected by the odor on entering the building, but not enough to make one conscious of an odor. The result was the immediate disappearance of all the stuffy condition and bad smells complained of. The remarkable thing was that every teacher and the principal pronounced the ventilation perfect. They stated that the conduct of the children as to lessons and behavior was noticeably better. No drowsy afternoons followed. Teachers stated they were as fresh at the close of the day as in the morning. Colds and coughs nearly disappeared. No contagious disease developed during the six weeks' trial, altho influenza was epidemic at this time. On several occasions a check was made on attendance, and not an absentee was reported on account of sickness.



Here are the Reasons for MACK Dominance

Features of the Mack Rotary Pump:

Lateral Intake and Lateral Discharge. This method of handling the water insures a *smooth, steady flow.* Pulsation, and Water Hammer is eliminated. The result is *more gallons per horse-power.*

The Mack greatly exceeds the Underwriters' demands by making delivery of 12 gallons per minute per horse-power at 120 pounds Pump Pressure.

Hardened cut-steel spur gears *running in clean oil* relieve the bronze "water gears" of all driving strain. This is a valuable feature as it minimizes wear.

Low pressure packing in the stuffing boxes cuts down friction loss and increases the efficiency of the pump. The Mack Rotary Pump is the only one in which the low pressure packing can be successfully used

The building of this pump was not an ordinary problem. The designers of the Mack Rotary Pump set themselves to the task of perfecting a pumping unit which would compare favorably with the mighty Mack Motor and Chassis. *That* was the problem.

The result is well-known to every user of Mack Motor Fire Apparatus.

INTERNATIONAL MOTOR COMPANY, NEW YORK

"PERFORMANCE COUNTS"

Mack TRUCKS

The building was constructed to permit perfect recirculation of the air, but the fresh-air intake was closed down to 2 inches, and the door to the basement was opened and the air drawn thru. The economy thus gained was about 25 per cent in coal. During the period of influenza epidemic of February and March, 1919, the attendance in this school was more than 3 per cent higher than the general average for this school.

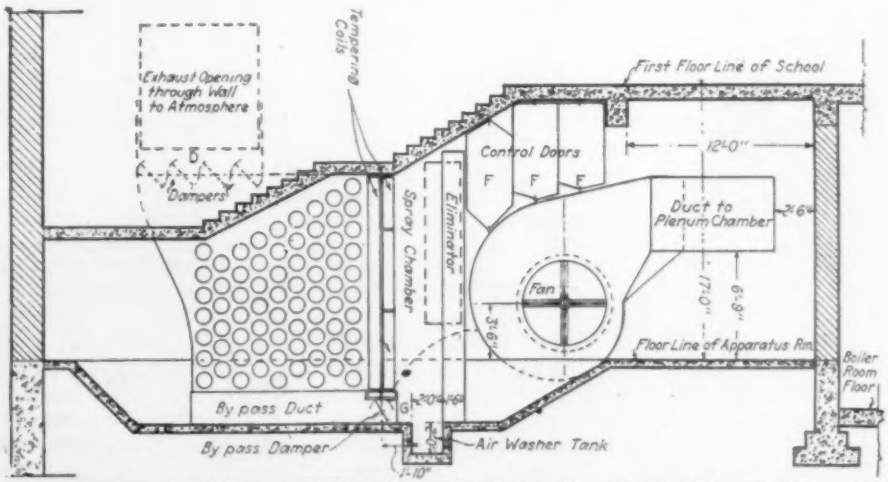
Trial in a School With Complete Recirculation of Air

The experiment was then transferred to a colored school having a plenum system with the Zellweger air-washing fan and with complete recirculation of the air. The ozone machine was set up just back of the fan, the ozone acting upon the water of the air washer as well. In this test the pupils and teachers were weighed weekly and a close inspection was made by the staff physician of the hygiene department. The data from the weighing were interesting and instructive. About 75 per cent of the children gained in weight, an average of about one pound each. About 20 per cent showed no change, and about 5 per cent lost weight. Several very fat girls weighing about 175 pounds each lost weight, from 5 to 8 pounds. No indication of any illness or discomfort was noted. The principal was an old man, perhaps 70 years of age. He weighed 218 pounds and was quite inactive. After about a week he complained of dizziness and of feeling ill, altho on duty regularly. He lost about 15 pounds in weight. The physician made daily examinations and was at a loss to explain his condition. He was not sure whether it was due to ozone or was merely a coincidence. But after a study of the weights of the children it was decided that the ozone had caused a rapid oxidation of this superfluous tissue and it had been poured into the lymphatic system faster than the kidneys could remove it, and the result was the illness stated. It is interesting to note that this principal has been in better health since that time and is anxious to have the ozone installed permanently. It is simpler than exercising for reducing weight.

No contagious disease occurred in this school. Both parents of one family died of influenza during this period, and neither of two children in school contracted the disease. Colds were noticeably less. This colored school was perfectly free from odors. The coal consumption was measured, and in comparison with days of equal outside temperature the coal used was almost exactly one-half. Agar plates were exposed in a room filled with pupils ,and the average count of bacteria was 225, which was extremely low, indicating that the ozone had destroyed the active germs of the air.

Trial With Complete Recirculation But Without Air Washer

Further test was made, of another school



NEW DESIGN OF HEATING SYSTEM FOR SCHOOL BUILDING OF THE ST. LOUIS BOARD OF EDUCATION, SHOWING METHODS OF INCORPORATING OZONE APPARATUS

Federal government truck used on road work near Des Moines, Ia.

Another FEDERAL

Federal Trucks for County or City Use

The knowledge that the truck you buy for municipality, county or township work has the ability to do its work faithfully, 360 or more days each year for a long period of years is the knowledge that will prompt you to make "Another Federal" the next truck you buy.

Federals everywhere, on state, county or city jobs, and giving the same carefree, dependable service that has made them so popular in this field.

They are built in capacities of from one to five ton—a capacity and size for your every need.

"Traffic News" an interesting magazine on the subject of haulage sent monthly on request.

FEDERAL MOTOR TRUCK COMPANY
34 FEDERAL STREET DETROIT, MICH.

This is the sign of the 10th year Federal—a sign significant of ten years' success in every field of truck transportation.

"Shorten the Miles to Market—Use Motor Trucks"

having complete recirculation without the air washer. In this school no teacher or pupil was aware of the experiment, and after ten days the principal sent a note to the teachers to report whether they had observed any change of air in the building, whether worse, or better, or no change. Three had observed no change; all the others reported that they had noticed improvement; some were enthusiastic. One had first observed a marked improvement in the work of the pupils and was unable to account for it. One said it was delightful. No complaint of poor ventilation had come to his office during this period. The principal volunteered the statement that he was sure it was a great improvement. The economy in coal was a little less than 50 per cent.

Results of One Year's Tests

To sum up the results of a year's tests with ozone in the schools, the following facts are indicated. Ozone does destroy all odors resulting from the respiration, bodies and clothing of the children. It produces a mild exhilaration resembling that of a sea breeze or the air on a morning after a thunderstorm. It removes smells from the building due to lodgment of dust in ducts and the like. It destroys toilet room odors. When used in proper concentration for ventilation, it has no odor itself. It reduces weight in persons corpulent from inactivity. It appears from limited data to be a preventive of influenza. It undoubtedly is of great value in the treatment of influenza and pneumonia, as demonstrated in the influenza hospital at St. Louis last year. To this should be added the evidence adduced by the medical authorities of France that ozone increases greatly the oxyhaemoglobin of the blood, thereby increasing the oxygen-carrying capacity of it. This in turn cures anemic persons. The introduction of ozone in ventilation would probably remove the necessity for open-air schools now common in most cities.

Having carried out these experiments to the satisfaction and enthusiastic approval of all concerned, and having discovered what seemed to have heretofore prevented the introduction of ozone in ventilation, it is deemed proper to give here some concrete details governing the installations in school buildings. In the St. Louis experiments it was early determined that in ventilation with ozone the maximum concentration should be too low to give an ozone odor.

Tests were made to determine the effect on teachers and pupils when ozone was used up to that maximum. No illness or discomfort was detected in normal persons. On the contrary, a mild exhilaration was experienced in every way similar to that of the refreshing sensation after a thunderstorm. As previously noted, the very corpulent persons lost weight, and in the case of an old man leading a very inactive life, ozone caused dizziness and headache for several days. The net results of this experience were of great benefit to all the persons. It reduced the weight to the extent of the inactive tissues. A few persons at first felt a roughness of the throat, a slight over-stimulus of the mucous membrane, which disappeared within two days. It has therefore been demonstrated that ozone used in a concentration up to the point of producing an ozone odor is safe for ventilation. This may be called one of the calibrating points in the scale. However, persons not accustomed to ozone air must be used for detecting the odor, as the sense of smell for ozone quickly declines when exposed to it.

Having ascertained that chemical means of determining the quantity of ozone for ventilation were impractical, the writer proceeded to develop a standard from the manufacturing standpoint, which may be used in determining in advance the proper concentration for any given volume of air movement or for a given number of occupants of a room. This standard was developed after ascertaining that with a given voltage and a given thickness of dielectric, the amount of ozone generated was proportional to the number of brush discharge points of the generator.

The most satisfactory apparatus uses 4,000 volts alternating current from a static transformer, all inclosed with the ozone generator unit, which uses a micanite plate dielectric, 0.040 inches thick, and aluminum points spaced approximately ½-inch apart. It was observed that 600 brush points made just enough ozone for 1,000 cubic feet of air from the blast fan.

This test was with rooms filled with 45 to 50 children much below the average in cleanliness. For rooms occupied by fewer persons the brush points or voltage should be reduced. If conditions are to remain constant, some points should remain constant, some points should be disconnected,

Packard Truck with tank body and special street-flushing equipment. Note how the Packard concentrates the load on the rear axle—with advantage of easier control and less wear from vibration.

Keeping the Traffic Arteries Open

IT is estimated that last February's storm cost the New York public alone over a million dollars a day—largely due to antiquated snow-hauling equipment.

One bad storm often wipes out all the apparent savings of years in buying trucks on a price basis.

The City Official who feels the responsibility of keeping the highways open is looking more and more at what a truck can *do*—rather than the price at which it can be assembled.

The following National Standard Truck Cost System facts on the performance of over 1700 Packard Trucks in 1919 have a *vital significance* for the truck user.

An average *saving in gasoline* of 10 *per cent*—due to greater efficiency in operation with the aid of the National Standard System.

The National Standard System used in connection with Packard Trucks has shown it possible to reduce cost per ton-mile.

Truck owners who have used the System for a year or more, and have compared the Packard with other trucks, are *standardizing* on Packard.

* * *

The driver finds the Packard easier all around to handle.

Less vibration; because of the *smooth-running* Packard engine, the construction of the worm drive, and the placing of 85 to 95 per cent of the live load on the rear axle.

Easier handling on the hills, owing to Packard high tractive force on the road; and four-speed transmission graded up by regular steps.

With the thinking City Official, these transportation economies far outweigh "features" and "talking points."

"Ask the Man Who Owns One"

PACKARD MOTOR CAR COMPANY, *Detroit*

but with varying conditions a controller should be installed to regulate the voltage by taking taps out of the primary of the transformers.

Where the air is recirculated in whole or in part, the ozone must be cut down to the point where no ozone odor is noticeable. In fact, the revitalizing of the air of the average schoolroom when recirculating 90 per cent of the air will be effectively done with half the maximum stated above. The writer believes that the delay in the use of ozone in ventilation has been due to trials made with too high concentration and to the absence of any information on a means of control.

It is also true that until recently ozone was produced by static discharges thru the air, the open arc or spark producing nitrogen compounds which were objectionable for ventilation. Ozone should be used with the blast fan to get uniform distribution, and the ozone machine should not be started until the fan starts.

Where it is desired to use ozone to take the place of ventilation in rooms with direct radiation, a small apparatus with a fan self-contained should be used to distribute the ozone. It is fortunate that ozone is heavier than air and tends to get to the lower stratum of air, which is the impure stratum. Ozone does not destroy dry bacteria, but destroys most species of germs when moist, and if sufficient humidity is maintained in an unventilated room, the moisture of the mucous membrane will be sufficient to enable ozone to destroy most bacteria.

The results obtained in these experiments call for a recasting of all our ideas on heating and ventilation. In the attempt to improve the systems, much superfluous junk has crept into even standard specifications. With a reliable means of revitalizing the air, the sizes of boiler, fan and air washer are greatly reduced. As the air carries within itself the revitalizing element, a small variation in air flow will not affect the children. The expensive hot room and tempered-air chamber, together with the individual duct and mixing dampers, may be dispensed with.

The figures show a plan and a sectional view of the apparatus room of the last building designed by the St. Louis Board of Education. It will be noted that the plant is concentrated into compact quarters. The vented air goes to the attic without galvanized iron ducts, only the heated air being carried in iron ducts. The vented air passes up the concrete shaft about the air ducts. To avoid heat losses in the attic, an insulated trunk duct picks up the air from the shafts at the end of the wardrobes. This vented air is delivered thru the ceiling into the apparatus room as shown. This air may pass thru control dampers and the ozone apparatus directly into the fan with 10 per cent or any other amount of new-washed and humidified air, the proportion being at will, or dependent upon the house leakage.

ACKNOWLEDGMENT.—From a paper read at the annual meeting of the American Society of Heating and Ventilating Engineers, New York.

A Law to Punish the Transportation of Stolen Motor Vehicles

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that this act may be cited as the National Motor Vehicle Theft Act.

Sec. 2. That when used in this act:

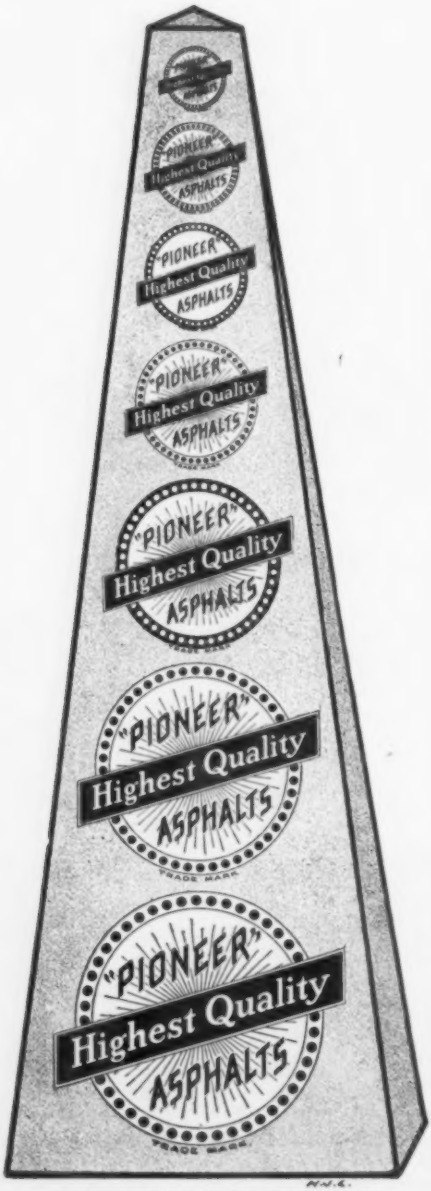
(a) The term "motor vehicle" shall include an automobile, automobile truck, automobile wagon, motorcycle, or any other self-propelled vehicle not designed for running on rails;

(b) The term "interstate or foreign commerce" as used in this act shall include transportation from one state, territory, or the District of Columbia, or to a foreign country, or from a foreign country to any state, territory, or the District of Columbia.

Sec. 3. That whoever shall transport or cause to be transported in interstate or foreign commerce a motor vehicle, knowing the same to have been stolen, shall be punished by a fine of not more than $5,000, or by imprisonment of not more than five years, or both.

Sec. 4. That whoever shall receive, conceal, store, barter, sell, or dispose of any motor vehicle, moving as, or which is a part of, or which constitutes interstate or foreign commerce, knowing the same to have been stolen, shall be punished by a fine of not more than $5,000, or by imprisonment of not more than five years, or both.

Sec. 5. That any person violating this act may be punished in any district, in or thru which such motor vehicle has been transported or removed by such offender.



A MONUMENT TO QUALITY

"PIONEER"

EXPANSION JOINT COMPOUND

Equipped with the newest and most up-to-date machinery for producing paving joint compound we are able to give a better product and better service than ever before.

You simply cannot make a mistake in using PIONEER Expansion Joints in your work. They are made of pure asphalt and are 100% efficient.

Write for samples and prices.

HERE'S A NEW ONE

"PIONEER"

RUBEROAD CEMENT

A new product that will interest every Engineer and Contractor. Just the thing for repairing cracks in concrete roads, and for making cold patches in all kinds of asphalt construction.

It Is New—It Is Different
It Is Efficient

The Pioneer Asphalt Co.
Lawrenceville Ill.

Municipal and Civic Publications

The Turnpikes of New England—An Evolution of the Same Through England, Virginia and Maryland.

FREDERIC J. WOOD, Member, Am. Soc. C. E., Boston Society of Civil Engineers, New England Historic Genealogical Society. Marshall Jones Company, Boston. 1919. vii + 441 pp. Diagrams and illustrations.

The author of this interesting and valuable volume discovered in 1908, when preparing a report on certain transportation facilities, that public and technical libraries contained little or no material regarding the old turnpikes of the northeastern section of the United States. These turnpikes were the first public utilities in this country, being antedated only by a few water companies. This book is the outcome of a genuine interest in early road-building transportation facilities and a commendable desire to provide a work which would contain a complete record of the old turnpike companies and their problems. The stories of the various companies are interestingly told, and the problems of the early bridge builders are given in detail. While primarily a historical volume, it will prove profitable reading for engineers. Those who enjoy a trip into the olden days will delight in the stories of the New England roads, which have become so well known in late years, particularly thru the advent of the automobile. The author gives the reader a more thoro appreciation of the value of good roads to the country, which is summarized in the quotation from Ralph Waldo Emerson which graces the page preceding the frontispiece:

"When the Indian trail gets widened, graded and bridged to a good road, there is a benefactor, there is a missionary, a pacificator, a wealth bringer, a maker of markets, a vent for industry."

American Civil Engineers Hand Book.

MANSFIELD MERRIMAN, Editor in Chief. John Wiley & Sons, Inc., New York, 1920. Fourth Edition. 1,955 pp. Diagrams and tables.

Owing to the increasing size of the well-known Merriman's Pocket Book, the fourth edition, just issued, is now more properly called a hand book. With the revisions and the addition of 375 pages, this book maintains its preeminence as a reference volume for all engaged in civil engineering practice.

Americanization.

CAROL ARONOVICI, Ph. D. Keller Publishing Company, St. Paul, Minn. 1919. 48 pp.

The viewpoint from which this booklet is written is that of an immigrant from the educated classes of Roumania, who began his career in the United States as a laborer and finished his university education here, and has spent twenty years in self-Americanization and more than half as many in studying the conditions which affect our immigrant population. He analyses the present methods of Americanizing the foreigner, and also their success in developing loyalty to American ideals without losing the high qualities with which the alien may be able to enrich our democracy.

Insect Life on Sewage Filters.

W. H. PARKINSON, M. D., P. H., and H. D. Bell, A. I. G. The Sanitary Publishing Company, Ltd., 8, Breams Buildings, London, E. C. 1919. VIII + 64 pp. Diagrams.

A detailed technical presentation of the results of studies by the author of various forms of insect life on the sewage filters of Manchester at Davyhulme and Stratford-on-Avon. The treatise covers intensive studies of the life cycle of various sewage organisms and their effects on the action of sewage filters.

Proceedings of the National Conference of Social Work.

Apply to WILLIAM T. CROSS, Secretary of the Conference, 315 Plymouth Court, Chicago, Ill. 1920. x + 813 pp.

A Handbook of Petroleum, Asphalt and Natural Gas.

ROY CROSS, Kansas City Testing Laboratory, Kansas City, Mo. 1919. 496 pp. Charts, tables and illustrations.

In the preface to this valuable volume, the author states that the book has been published for the benefit of the petroleum producer, seller, refiner and technologist, but the material covers statistics on the production, properties, handling, refining and methods of valuation of petroleum and related products which will be found of great value to the engineer and the purchasing agent who are handling these products for government units.

The opening chapters give in concise manner the economics, geology and production and refining statistics of oil and gas wells in the United States. The remaining chapters deal with the storage, measurement, gauging and transportation of these products and their derivatives. The chapter on the refining of oil for road-building and paving purposes is of particular interest to the highway engineer, as it covers the composition of asphaltic oils, analyses of typical pavements, specifications and tables for the use of asphalt oils and the use of these oils as surfacings for concrete pavements and as joint fillers for different types of brick pavements.

The Motor Truck as an Aid to Business Profits.

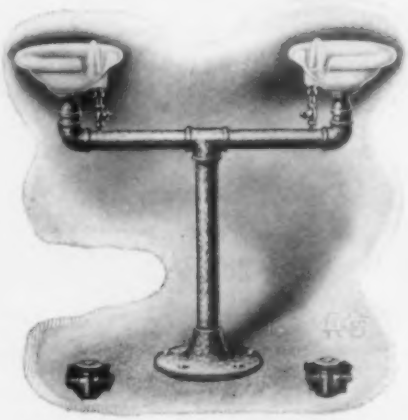
S. V. NORTON. A. Shaw Company, Chicago, Ill. xxi + 509 pp. Illustrated.

The title of this book might lead one to believe that it was intended solely for the man contemplating a motor express or for the use of business houses in developing their delivery systems. A careful study, however, shows that it contains material of great benefit to municipalities, contractors, engineers, chambers of commerce studying the transportation problem, and all others interested in the development of transportation facilities. The opening chapter discusses at length the field of the motor truck in modern business and how it can be used to overcome many transportation difficulties. The question often arises in one's mind as to the proper time to change from horse-drawn vehicles to motorized equipment; this is discussed in another chapter, which will be of interest to those who are contemplating such changes. The comparative costs of horse and truck deliveries and the methods used to determine operating costs for motor trucks are outlined, with a careful delineation of the Truck Owners' Conference System, generally known as "National Standard Truck Cost System." All motor trucks are not applicable in one particular service, and considerable help is given to the prospective truck owner or user in the discussion of this problem. One might say that the motor truck itself has already reached the peak of its usefulness, but the ingenious automobile engineer has added the trailer, which has doubled and even trebled the value of the motor truck in hauling and delivery systems. A careful study of the use of trailers should be made by municipal officials in charge of garbage and ash collection systems, by contractors in their hauling of materials, and by business men who have difficult hauling and delivery problems. Finally, the book covers the personal element in motor truck operation, i. e., ways and means for helping the driver to care for his truck, proper lubrication and care of tires, as well as many other hints which will be found invaluable to the reader.

Principles and Methods of Industrial Education for Use in Teacher Training Classes.

WILLIAM H. DOOLEY, in charge of Navy Yard Continuation School for the New York Board of Education. With an Introduction by Charles A. Prosser, Director of the Federal Board for Vocational Education. Houghton, Mifflin Company, Boston. 1919. xi + 257 pp. Illustrated.

Are You Familiar with the Danger of the Vertical Stream Fountain?

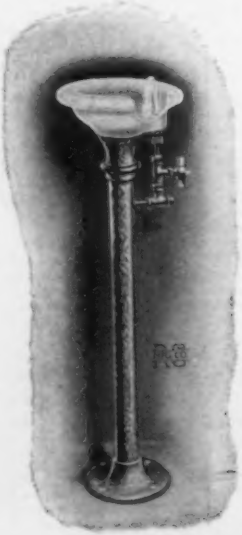


EXHAUSTIVE and scientific tests conducted by eminent authorities prove that vertical stream drinking fountains are a menace to the public health. It has been shown that the water which has touched the lips can fall back into the jet and seriously contaminate the source of supply.

Rundle-Spence "Vertico-Slant" Overcomes All Objections

The "VERTICO-SLANT" is the nearest to the 100% sanitary fountain that can be produced. It is the very latest feature in modern drinking equipment. The stream bubbles out at a practical and convenient angle. Lips cannot touch jet — water cannot fall back. Drinking fountain experts proclaim this fountain as sanitary in every respect — overcoming every objection to the old bubbler type. Ideal for schools, public buildings, parks and streets.

Send address for illustrated descriptive matter treating on the subject of sanitary drinking fountains.



Rundle-Spence Mfg. Co.

Milwaukee Wisconsin

The two-head fountain shown at the top of the page not only has a vertical slant stream for each bowl, but has a foot operating device as well, making it possible for anyone to take a drink without using his hands, which is an essential element in minimizing contamination in public places.

Motor Truck Transport.

Two pamphlets issued by the Motor Truck Committee of the National Automobile Chamber of Commerce, Inc., 7 East 42d Street, New York, N. Y., giving, respectively, the following addresses delivered at the Highway Transport Conference in New York, 1920: "The Mid-West Farm Market for Motor Trucks," by Arthur Capper, U. S. Senator from Kansas; and "Motor Truck and Railroad Freighting" (comparisons as to cost, range and service of moving less than car-load shipments via freight to short-haul points, and the movement of the same class of freight via motor trucks), by W. J. L. Banham, General Traffic Manager, Otis Elevator Company. (Apply to the National Automobile Chamber of Commerce.)

Surface Water-Supply of the United States.

Part XI of a series of 14 reports presenting results of measurements of flow made on streams in the United States during the year ending September 30, 1916. Entitled, "Pacific Slope Basins in California." Data collected by the United States Geological Survey. This volume prepared by Nathan C. Grover, Chief Hydraulic Engineer, and H. D. McGlashan and F. F. Henshaw, District Engineers, in coöperation with the State of California. Water-Supply Paper 441 of the United States Geological Survey. (Apply to the Government Printing Office, Washington, D. C.)

Official Directory of the City of New York.

Third Edition (1920) of this handy little pocket reference book, compiled by William Viertel, Editor of the *City Record*, under the direction of Peter J. Brady, Supervisor of the *City Record*. 164 pp. It contains a brief history of New York City, information as to the personnel of the city, county, state and federal offices, and the city institutions and their functions. Furnished both in paper and in leather covers. (Apply to the Supervisor of the *City Record*.)

Police Departments in Kansas Cities.

A report on Police Departments in Seventeen Kansas Cities of the First and Second Class and in Twenty-Five Out-of-State Cities. A summary of the answers received to a questionnaire on the subject of police departments, including the number of officers, salaries paid, whether or not uniforms are furnished by the city, and policemen's benefit funds. Compiled and mimeographed by the Municipal Reference Bureau of the University Extension Division of the University of Kansas, Lawrence, Kans., March 1, 1920. (Apply to the Bureau.)

"Save the Youngest."

Seven charts on maternal and infant mortality, with explanatory comment. Published by the Children's Bureau, U. S. Department of Labor. Children's Year Follow-up Series No. 2; Bureau Publication No. 61. (Address the Bureau, Washington, D. C.)

Publications of the United States Public Health Service.

An invaluable list of the printed matter distributed by the U. S. Public Health Service, with information about how to secure the various periodical and special publications. Dated April, 1919. 94 pp. Miscellaneous Publication No. 12. (Apply to the Government Printing Office, Washington, D. C.)

Michigan Health Almanac, 1920.

The January, 1920, issue of "Public Health," published by The Michigan Department of Health, is arranged in almanac style and conains considerable miscellaneous health information and numerous household hints, with enlivening paragraphs of various kinds. 55 pp. (Write to Richard M. Olin, M. D., Commissioner, Michigan Department of Health, Lansing, Mich.

Town Planning in Bombay.

A quarto pamphlet of 64 pages, with diagrams, setting forth the results of the Bombay Town Planning Act of 1915, this being a paper read at a meeting of the Town Planning Institute, in London, on December 5, 1919, with the discussion thereon. Published by authority of the Town Planning Institute, 4, Arundel Street, London, W. C., England.

Rural Community Buildings in the United States.

This is the title of Bulletin No. 825 of the U. S. Department of Agriculture, a contribution from the Bureau of Markets, published January 30, 1920. It was prepared by W. C. Nason, Assistant in Rural Organization, and C. W. Thompson, Specialist in Rural Organization, and contains 36 pages, with illustrations. It shows the growing interest in community buildings and classifies them according to the source of funds for their establishment. Their general character, maintenance, operation and management, and the uses to which they are put, are presented in detail, and specific examples are described and illustratd. (Apply to the United States Department of Agriculture, Washington, D. C.)

Housing Betterment.

The February, 1920, issue of this quarterly publication of The National Housing Association contains 86 pages of exceedingly interesting material, a large portion of it referring to conditions in Europe. The opening article, on "England's Newest Housing and Town Planning Act," is by Frank Backus Williams. The material is all in brief, clear form, full of direct information. There are a number of "News Notes" from cities in the United States, and a list of recent books and reports on housing and town planning, prepared by F. W. Jenkins, Librarian of the Russell Sage Foundation. (Write to the National Housing Association, 105 East 22d Street, New York, N. Y.)

Municipal Reports

Chicago, Ill.—Annual Report of the Department of Public Works for the year ending December 31, 1919. (Apply to John A. Kleine, Chief Clerk of the Department.)

Chicago, Ill.—Department of Health. Report for 1911-1918. (Apply to John Dill Robertson, M. D., Commissioner of Health.)

Duluth, Minn.—Water and Light Department. Twenty-first Annual Report, for the year ending December 31, 1919. (Apply to P. G. Phillips, Commissioner of Public Utilities.)

Johnstown, N. Y.—Forty-first Annual Report of the Board of Water Commissioners, filed with the City Clerk, January 10, 1919. (Apply to Grover E. Yerdon, City Clerk.)

Kansas City, Mo.—Report of the Board of Fire and Water Commissioners for the year ending April 21, 1919. (Apply to Alex Henderson, Chief Fire Department.)

Kearney, N. J.—Tenth Annual Report of the Shade Tree Commission. 1919. (Apply to H. H. Sincock, Secretary, The Shade Tree Commission.)

Kewanee, Ill.—Revised Ordinance of the City. (Commission form of government.) Revised and edited by Thomas J. Welch, City Attorney, 1909-1919. Published by authority of the City Council, December 1, 1919. (Apply to W. A. Charlet, City Clerk.)

Los Angeles, Calif.—Annual Message of Meredith P. Snyder, Mayor, January 2, 1920. (Apply to the Mayor.)

Oshkosh, Wis.—"Municipal Recreation and Physical Education." A report of the Department of Recreation and Physical Education of the Board of Education, at the end of the third year, September 1, 1919. (Apply to A. S. Hotchkiss, Director of the Department.)

Palo Alto, Calif.—Annual Report of the Health Department for the year ending December 31, 1919. (Apply to Louis Olsen, Health Officer.)

St. Paul, Minn.—Bureau of Civil Service. Sixth Annual Report. 1919. (Apply to Jesse Foot, Civil Service Commissioner.)

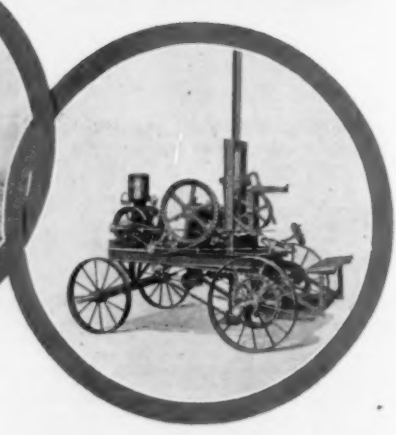
South Norwalk, Conn.—Sixth Annual Report of the Second Taxing District of the City of Norwalk, formerly the City of South Norwalk. August 31, 1919. (Apply to Arthur H. Sterling, District Clerk.)

Winnetka, Ill.—Annual Report of the Village for the year ending March 31, 1919. (Apply to John S. Miller, President of the Village.)

Buy Them as a Unit

WHEEL TYPE
P&H
EXCAVATOR

POWER TRACTION
P&H BACKFILLER



POWER TRACTION
P&H TAMPER

The purchase of a P & H Trenching Unit is a terse answer to the question of city trenching.

On city streets where work must be done with uniformity, and dispatch, the P & H combination —Excavator, Backfiller, and Tamper—is the logical equipment for the job.

Excavating: steady and fast with none of the irregularity and time consumption of human labor and at a cost that shows big in net savings.

Backfilling: getting the backfill back, and out of the way of traffic, in a hurry, and on one man's time.

Tamping: Finishing up a good job by ramming the backfill back to stay and with no danger of settling pavement later.

Real facts and figures on P & H Excavating Equipment are waiting for you, let us give some interesting and valuable data,—send for Bulletin X and Bulletin IX.

PAWLING & HARNISCHFEGER CO.

EST. 1884
MILWAUKEE, WISCONSIN

50 Church Street, New York
704 Stephen Gerard Building Philadelphia
926 Whitney Central Building, New Orleans, La.
47 Fidelity Building, Pittsburgh, Pa.
1241 Monadnock Block, Chicago, Ill.
Pittock Block, Portland, Ore.
1125 Central Building, Los Angeles, Cal.
821 Monadnock Bldg., San Francisco, Cal.

"You see them wherever you go, and they go wherever you see them"

P&H — excavators — back-fillers - tampers

Methods, Materials and Appliances

News for Boards of Public Works, Engineers, Contractors, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

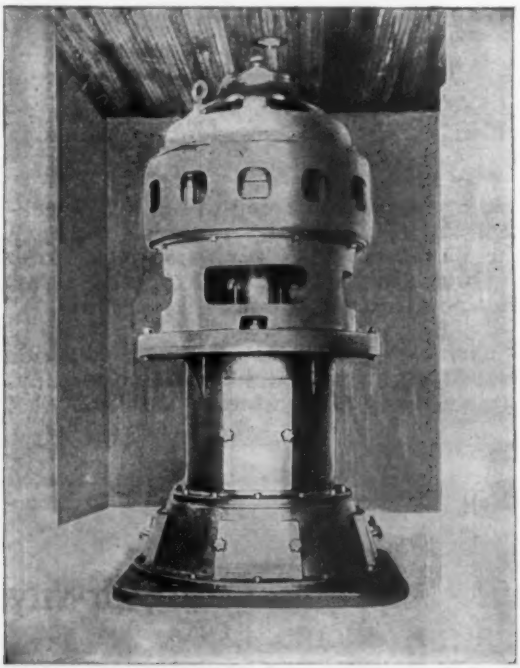
The Artesian Well-Pumping Units at Savannah, Ga.

The city of Savannah is now effecting a large saving every day on account of the installation of an electric-motor-driven pump on an artesian well furnishing 4,000,000 gallons of water daily to the city. The plant from which the city formerly got its water-supply cost $65 a day to pump a million gallons of water, while the new equipment pumps at the rate of $10 a million gallons, or a saving of $55 for every million gallons pumped.

If the city desires to install electric pumps thruout—and the indications are that it will do so shortly—a saving of $57,500 a year will be effected in fuel and labor costs.

The artesian well is 519 feet deep and was dug by the use of dynamite. A 24-inch casing was sunk to a depth of 110 feet, and from there to the bottom a 16-inch casing is used. The fact that this casing runs the full length of the well assures the consumer a supply of pure water. The pump, which is of the Layne & Bowler centrifugal type, is installed 100 feet below the surface. It is driven by a 200-h.p. 2-phase, 60-cycle, 2200-volt, 1175-r.p.m. vertical induction motor which was built by the Westinghouse Electric & Manufacturing Company, and shipped to Savannah from the East Pittsburgh Works by express because of its urgent need by the city. Current for the operation of the motor is supplied to the city by the Savannah Electric Company.

Tests made on the water pumped from the well have proved its superiority over the water formerly pumped from the River Station, and it is apparently much softer than any artesian water previously used in the city. The water contains some sulphur, lathers well, and is unusually well adapted for all domestic as well as commercial uses.



MOTOR-DRIVEN PUMP FOR ONE OF THE 4,000,000-GALLON ARTESIAN WELLS OF THE SAVANNAH, GA., WATER-SUPPLY

A further evidence of the saving to be gained by the operation of the new outfit is shown by the following figures submitted by the city officials: The original system, with a capacity of 1,000,000 gallons, was installed at an original cost of $750,000, and the operating cost amounted to $30 per million gallons; to install the new system cost $10 a million gallons, so that not only is there a large reduction in first cost, but the operating costs are reduced two-thirds.

The total number of wells completed, or for which contracts have been let, is five, to be driven by motors of the following capacities: one 100-h.p.; two 200-h.p., and one 300-h.p. All the motors are installed above ground except one, which is located under the street in a pit entirely enclosed and furnished with forced draft ventilation.

Asphalt Association Moves Office

Permanent headquarters for the Asphalt Association have been established at 25 West 43d Street, New York City.

A Modern Lighting System

does *not* require separate Lamp Standards as this street scene clearly shows.

Missoula, Montana, is one progressive western city utilizing "ELRECO" Combination Railway and Lighting Poles, which makes separate Lamp Standards unnecessary.

The "ELRECO" Steel Poles support ornamental lighting brackets with modern General Electric Lighting units; also, the span and service wires of the Railway and Lighting Company; keep the streets free and unobstructed from extra Lamp Standards, wooden poles, and a multiplicity of wires, etc.

The usual practice of financing such an installation is to divide the cost between the local Street Railway and Lighting Company, Merchants and the City, making the cost of "WHITE WAY" very reasonable.

What other progressive cities have accomplished is well illustrated in our handsome Catalog "F", sent on request to those interested.

Electric Railway Equipment Company

CINCINNATI, OHIO.

New York Office — 30 Church Street

Proper Sanitary Toilet Facilities for Public Parks and Rest Rooms

The problem of proper sanitation of park facilities has always been one of vital importance, but because many parks are in isolated sections or in districts that are being built up around natural beauty spots beyond the sewer limits, the installation of proper sanitary facilities has been difficult. This, of course, has never been a problem in parks that are centrally located in large cities with sewerage and water-supplies, but in parks on the outskirts and in the suburban districts of large cities, or around lakes, or in small towns that are not served by sewers, the old outside pit type of privy has always been a source of annoyance to health officials and park commissioners. There are to-day scattered thruout our country thousands of parks that are beautiful so far as artificial lakes, ponds, flowers and shrubbery are concerned, but in which can be found, hidden back of clumps of bushes, breeders of disease called rest rooms, or toilet rooms—a repulsive condition, but one which in years gone by could not be controlled systematically and efficiently.

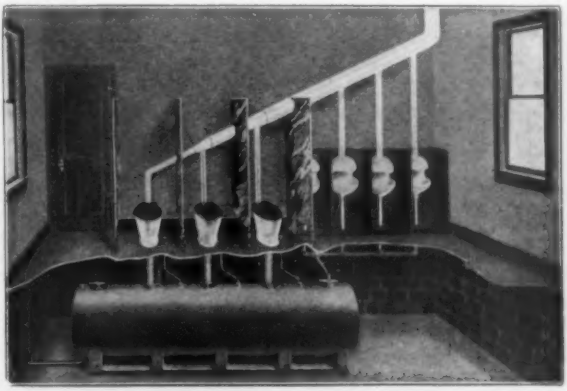
Scientific research and sound mechanical engineering have now found a solution of this world-wide problem, and to-day many manufacturers are offering to the trade a perfected system of sewage disposal called the chemical toilet that is efficient, guaranteed odorless and sanitary, and is approved by boards of health and boards of education and leading sanitarians everywhere.

The accompanying illustration shows a popular type of multiple installation of chemical toilets for public buildings where more than one bowl is required, manufactured by the Dail Steel Products Company, 199 Main street, Lansing, Mich. It is figured that, on the average, one bowl will take care of from 15 to 20 persons daily for six or seven months.

The chemical toilet is recognized as the logical type of sewage disposal for unsewered districts. Colonel C. W. Stiles, U. S. Public Health Service, in a paper read at New Orleans before sanitarians, rated the chemical toilet 75 to 100 per cent efficient for disposal for districts not served by sewers. An efficient chemical toilet must of necessity be constructed along good engineering principles. The principal necessities of an efficient toilet are the following: There should be a well-made tank of non-corrosive metal; each tank should have a 125-gallon capacity per bowl opening for single units, and 100-gallon capacity per bowl opening for multiple units. The tank should be fitted with an efficient system of agitation, so that the excrement is thoroly mixed with the chemical charge that is put into the tank, to promote proper chemical action and the breaking up of the excrement. The tank should also be fitted with a large drain valve with an opening of not less than 3 inches, which is easily accessible, and, when the tank becomes two-thirds full, allows it to be drained off into what is known as a cesspool or leaching pool, or some other sort of seepage system, many kinds of which are used successfully.

The bowl should be made of the very best vitreous china, and should be equipped with a good, finely finished seat, and the bowl should be so designed that it will be properly ventilated. Without proper agitation and ventilation no chemical toilet can be a success. The Dail Steel Products Company makes a specialty of free engineering service, and where multiple installations are to be used, the company makes a rough sketch of the building and constructs the outfit and the ventilating pipe to meet the particular requirements of that building, so that when the outfit arrives the average contractor can put it in according to the plans. Then the company feels safe in guaranteeing the successful operation of the equipment.

It is of vital importance to all the citizens of the United States to promote to the utmost better sanitary conditions everywhere. The United States Public Health Service is making a fight to improve these conditions. In the many surveys made by the Service it has been found that only 2 per cent of privies in unsewered districts are sanitary. This is an appalling condition. It is therefore highly essential that much attention be given to the proper sanitation of rest rooms and toilet rooms in public parks. The health of the people to whom the parks are the only means of recreation during the summer months is of the greatest importance. To eliminate the possibility of spreading disease bred by improper toilet facilities is an essential part of the park service. It is gratifying that by the installation of the modern chemical equipment here described this danger to the public welfare is summarily dealt with.



A MULTIPLE CHEMICAL TOILET

To meet the demand for homes, construction was carried out on schedule despite the severe conditions of a New England winter

An extensive housing development for textile mill employes at Nashua, N. H.
DESIGNED AND CONSTRUCTED BY MANN & MACNEILLE

A practical service for Chambers of Commerce, Manufacturers and Real Estate developers faced with one of today's more difficult problems

PROVIDING HOMES FOR INDUSTRIAL EMPLOYES

Finance-Location-House design-Construction-Sales policy

¶Through our recent investigation of the activities of Chambers of Commerce in finding means to relieve the shortage of homes for industrial employes, we note that many officials and members of Housing Committees are facing this serious problem with its ramifications of finance, building costs and general policy. Industrial expansion today almost invariably calls for additional homes.

¶To meet this situation, not only civic housing corporations but manufacturers and real estate developers are giving serious consideration to the construction of groups of dwellings. The planning of homes for workmen; the laying out of these new residential sections, and the efficient construction of groups of houses, constitutes a new science in which the service of specialists may prove invaluable.

¶Several years ago, foreseeing the need of this service, the Industrial Housing Department of Mann & MacNeille was organized. Analytical study of this subject, combined with extensive field experience, including entire charge of housing for the Army Ordnance Department for a long period during the war, has resulted in the development of the largest and most efficient organization of this type in America. Under one contract we are prepared to advise on financing; design, construction and determine the sales policy for any type of housing operation. We shall be glad to tell you how we approach a problem of this nature.

The Service of

MANN & MACNEILLE

ARCHITECTS AND CONSTRUCTION ENGINEERS

Main Office
Grand Central Terminal
NEW YORK CITY

Branch Office
Book Building
DETROIT, MICHIGAN

Literature and further details on written or personal request

HEATING TAR IN A NUMBER OF KETTLES ON A NEW YORK STATE HIGHWAY JOB WHERE SMALL UNITS PROVED PARTICULARLY ECONOMICAL

Wood-Burning Tar-Heating Kettles

One of the most popular tar-heating kettles manufactured by the Tarrant Manufacturing Company, 12 Maple avenue, Saratoga Springs, N. Y., for use on small jobs, or where a number of kettles can be used to advantage on one job, is "Tarco" Kettle No. 4. This kettle has a length of 6 feet 9 inches, a width of 32 inches, and a height of 36 inches. The inside of the fire box is lined with 20-gauge corrugated iron to a height of 18 inches, which prevents the warping of the outside sheet. The outer kettle is reinforced on all sides with appropriate size angle irons. The feed door at the rear end is 18 inches long and 12 inches high. In order to insure a large smoke space and prevent the cutting down of draft by the accumulation of ashes at the front end of the kettle, the forward end of the outer tank is rounded. The smokestack which surmounts this is oval, 4 feet high, covered with a cowl top. The draw-off is fastened to the inner body by means of a heavy pipe flange with 1½-inch pipe and iron lever-handle stop cock. This draw-off can be placed at the back, or at the side of the kettle. This kettle, which weighs 1,200 pounds, is particularly recommended by the manufacturers where heavy work and service are required.

Highway Engineering at N. Y. U.

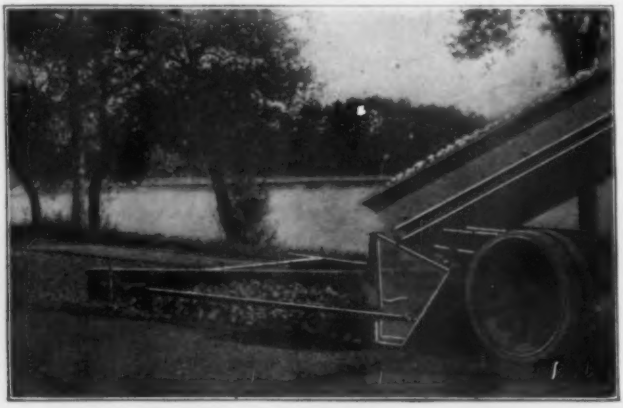
H. Eltinge Breed, M. Am. Soc. C. E., Consulting Engineer, 507 Fifth avenue, New York City, has been placed in charge of the courses in Highway Engineering in the School of Applied Science of New York University.

Mr. Breed served several years on road and canal work for the state of New York; was Assistant Chief Engineer of the Coleman du Pont Road in Delaware, and has studied roads and road building in Europe. Since 1915 he has been First Deputy Commisioner of the New York State Highway Commission, in which capacity he redesigned the Storm King Highway. He has lectured at Cornell and Michigan Universities, as well as at New York University.

New District Engineer for Eastern Paving Brick Manufacturers' Association

Announcement has recently been made by William B. Perkins, Chief Engineer, Eastern Paving Brick Manufacturers' Association, 1019 Lincoln Building, Philadelphia, Pa., that Captain P. C. Painter, late of the Engineering Corps of the United States Army, and former Senior Highway Engineer of the United States Bureau of Public Roads, has been appointed District Engineer of the Eastern District of the Eastern Paving Brick Manufacturers' Association, with headquarters at Philadelphia. Mr. Painter has had considerable experience, having been connected with the Paving Commission of the city of Baltimore for a number of years, and while in the army being in charge of road construction and maintenance in France. This office is glad to coöperate at any time with engineers who have paving problems.

On a Two Mile Contract



you can save in labor, time and material to pay for this

BURCH STONE SPREADER

and on every contract thereafter it will add greatly to your profits.

Handles any size stone for road building. Eliminates guesswork and rehauling by accurate spreading at any depth desired.

Most successful contractors say it is indispensable to them.

Write now for descriptive literature regarding this and the Burch Stone Unloader—another money-saving, profit-making Burch product.

The Burch Plow Works Co., Dept. J Crestline, Ohio

The MURDOCK

PATENT ANTI-FREEZING

BUBBLE FONT

Is the only drinking fountain made that was designed and is built solely for outdoor use. It does not have to be turned off at the approach of cold weather.

THE ONLY FOUNTAIN MADE THAT IS STRONG ENOUGH TO WITHSTAND PUBLIC ABUSE.

Perfectly adapted for use on the Public Streets, in Parks, Playgrounds, School Yards, and all semi-exposed or uncertainly heated enclosures.

Write for fully illustrated literature to

The MURDOCK MFG. & SUPPLY CO.
(THE ORIGINAL HYDRANT HOUSE)
CINCINNATI, - - - - - - OHIO
Builders of Water Service devices since 1853

If you are interested in any of the Catalogues specified below, please give full particulars when writing, so we may send you the most suitable literature and information.

Jail Doors

Steel Window Guards

Iron Stairs

Folding Steel Bunks

Steel Lattice Jail Cage

No. A58 of Jail and Prison Work.
No. 509 of Canopies and Porticos.
No. 532 of Iron and Wire Fencing.
No. 534 of Builders' Iron Work.
No. A39 of Fire Escapes.
No. 429 of Wire Signs.
No. 5300 General.

In addition to these Catalogs and Portfolios, we have on file thousands of special designs. A selection of these together with a drawing to fit your particular needs will be sent you promptly upon request.

Centrifugal Pumps Saved the Day in Portland

In the City Park Station of the Portland, Ore., water-works are two 5-inch, 3-stage, horizontal split case centrifugal pumps, manufactured by the Fairbanks, Morse & Company, Chicago, Ill., direct-connected to 100-horsepower slip ring induction motors, with the necessary switchboard equipment for operation. The pumps have a capacity of 700 gallons per minute against a head of 300 feet when operating independently, and a combined capacity of 700 gallons per minute when working in series against a total head of 600 feet. The specifications called for an efficiency of 61 per cent when working independently against a 300-foot head, and acceptance tests show an efficiency of 64 per cent.

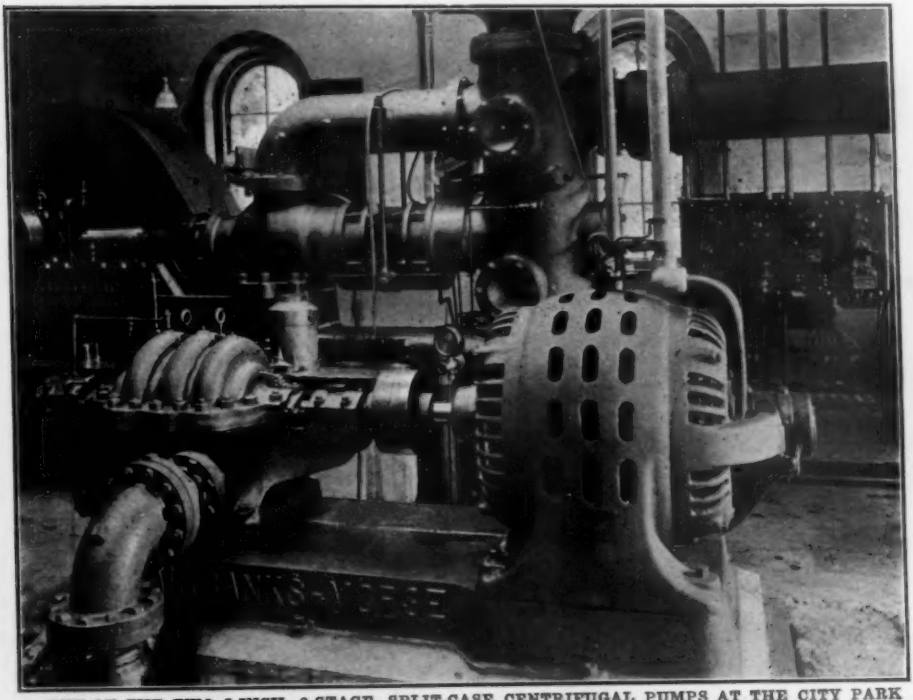
One 75-horse-power induction motor, direct-connected to a 3-inch, 5-stage centrifugal pump, was installed in Fulton Park, with the necessary switchboard equipment. This unit has a capacity of 350 gallons per minute against a head of 430 feet, and shows an efficiency of 35 per cent when tested. Another unit at Council Park consists of a 3-inch, 3-stage centrifugal pump direct-connected to a 40-horsepower induction motor. The pump has a capacity of 150 gallons per minute against a total head of 235 feet, with an efficiency of 55 per cent.

Kienle with Mathieson

John A. Kienle, formerly Sales Manager of the Electro Bleaching Gas Company, has been appointed General Manager of Sales of The Mathieson Alkali Works, Inc. This change was brought about by the severing of relations between The Mathieson Alkali Works, Inc., and its former sales agents, Arnold, Hoffman & Co., Inc. It is the intention of The Mathieson Alkali Works, Inc., to sell all of its products (caustic soda, soda ash, Virginia soda, bicarbonate of soda, bleaching powder, liquid chlorine, chlorine solvents, etc.) direct to the consumer instead of thru sales agents. Mr. Kienle has been placed in charge of the development of a complete sales organization. E. E. Routh, formerly Manager of Bicarbonate Sales, has been appointed as assistant to Mr. Kienle.

Reagan Made Eastern Sales Manager of Neptune

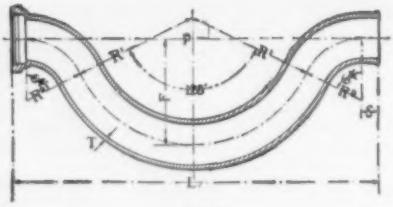
John F. Reagan, who for about ten years has been attached to the sales force of the Neptune Meter Company, 50 East 42d street, New York City, has been appointed Eastern Sales Manager of that company to fill the position made vacant thru the death of Daniel B. McCarthy. Prior to his association with this company, he was for more than ten years with the Consolidated Water Company, Utica, N. Y.



ONE OF THE TWO 5-INCH, 3-STAGE, SPLIT-CASE CENTRIFUGAL PUMPS AT THE CITY PARK STATION OF THE PORTLAND, ORE., WATER-SUPPLY SYSTEM

CLOW

Specials for Cast-Iron Pipe



A-1260
Deep Half-Circle Pipes

Where some pipe is already installed and you come in to carry on the work, you will find that Clow specials solve many problems.

Half-circle pipes are useful in going over or under pipe installed, or around manholes and other obstructions.

Many others—cutting-in tees and crosses, split sleeves and tees and a number of special devices—are described in "Pipe Economy"—*yours on request.*

James B. Clow & Sons

534-546 S. Franklin Street, Chicago, Ill.

Sales Offices:

New York **St. Louis** **Pittsburgh**
Minneapolis **Detroit** **Milwaukee**
San Francisco **Philadelphia**

REMOVING A DECAYED SPOT FROM AN OTHERWISE HEALTHY TREE

Surgery for Trees

The services of tree surgeons are increasingly appreciated thruout the country. Park superintendents and others having to do with the welfare of the shade trees thruout our cities are constantly becoming more careful to repair injuries and remove destructive diseases from trees.

The extent of internal decay in a tree is not readily apparent to the untrained eye. An innocent-looking hole in the stub of a tree may upon examination give evidence of an unhealthy condition, as indicated in the accompanying illustration. The decay shown had been going on for four years. Already much of the interior had been consumed, and in another few years only the merest shell would have remained, leaving the trunk so weak that the tree would have been an easy victim for any severe storm, were it not for the sort of tree surgery work developed by the corps of experts employed by the Davey Tree Expert Company, Inc., Kent, Ohio.

Mack Has New Cincinnati Branch

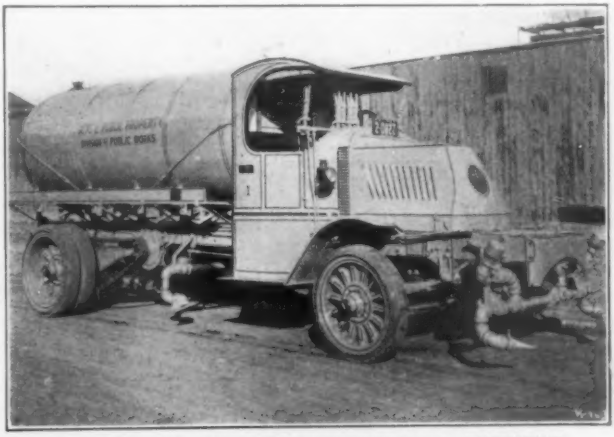
The International Motor Company of New York, manufacturers of Mack trucks, announces the opening of a branch at 1425-28 Central Avenue, Cincinnati, Ohio, under the name of the Mack-International Motor Truck Corporation. G. K. Ross will be in charge.

Westinghouse Acquires Interest in George Cutter Co.

The George Cutter Company, 413 Notre Dame street, South Bend, Ind., announces the acquisition by the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., of a financial interest in their company. The management and the commercial policies will remain unchanged, but advantage will be taken of the Westinghouse engineering and other facilities to expand the Cutter Company's activities and develop its lines to enable it to more effectively serve its customers and the industry. The Westinghouse Company will operate as sole distributors for the Cutter Company's products.

The National Steel Fabric Company Purchases Highway Materials Department

The Highway Materials Department of the H. H. Robertson Company has been purchased by the National Steel Fabric Company, First National Bank Building, Pittsburgh, Pa. Announcement is made that the balance of unfilled fabric orders will be shipped by the National Steel Fabric Company. Correspondence relating to past contracts or new business should be addressed to the National Steel Fabric Company, at the address above. E. L. Benedict, former manager of the Highway Materials Department of the H. H. Robertson Company, is General Sales Manager of the National Steel Fabric Company.



A 7½-TON, 1800-GALLON MACK FLUSHER RECENTLY PURCHASED BY THE CITY OF NEW ORLEANS, LA.

Puritan CANTONMENT DRINKING FOUNTAINS

Designed for and adopted by the Government for use in cantonments and Naval Training Stations during the war—now used by the largest industries and schools.

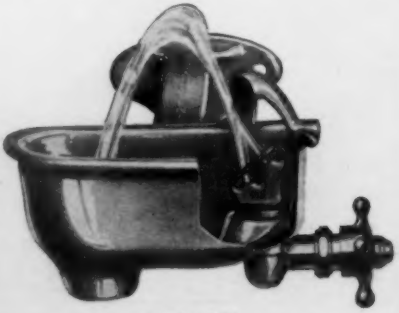
Patented
S-570

SANITARY—PRACTICAL—FOOL-PROOF

Halsey W. Taylor Company
WARREN, OHIO

Write for Catalogue

PURITAN S-566 "CANTONMENT"



Patented
Sectional View of S-566
Showing Practical Drinking Mound Formed in Stream